



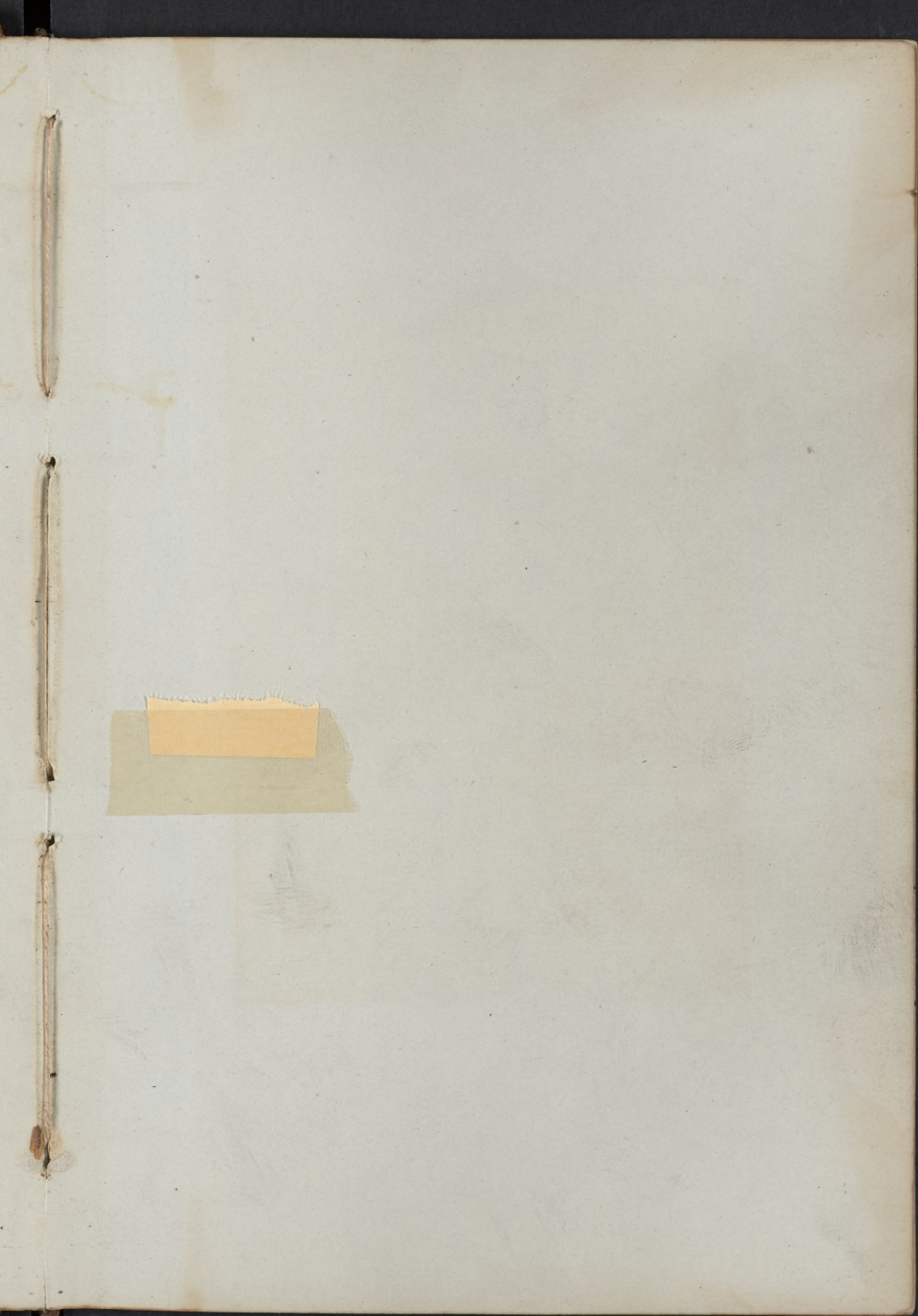
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Class 10a No 18.

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Lecture
by
Joseph Carson, M.D.

Emetics

This class of medicinal agents derive their name from the greek - word emes.

They may be defined to be substances that produce such an impression upon the stomach as to cause the expulsion of its contents through the cardiac orifice, the oesophagus and mouth.

The act itself is termed vomiting.

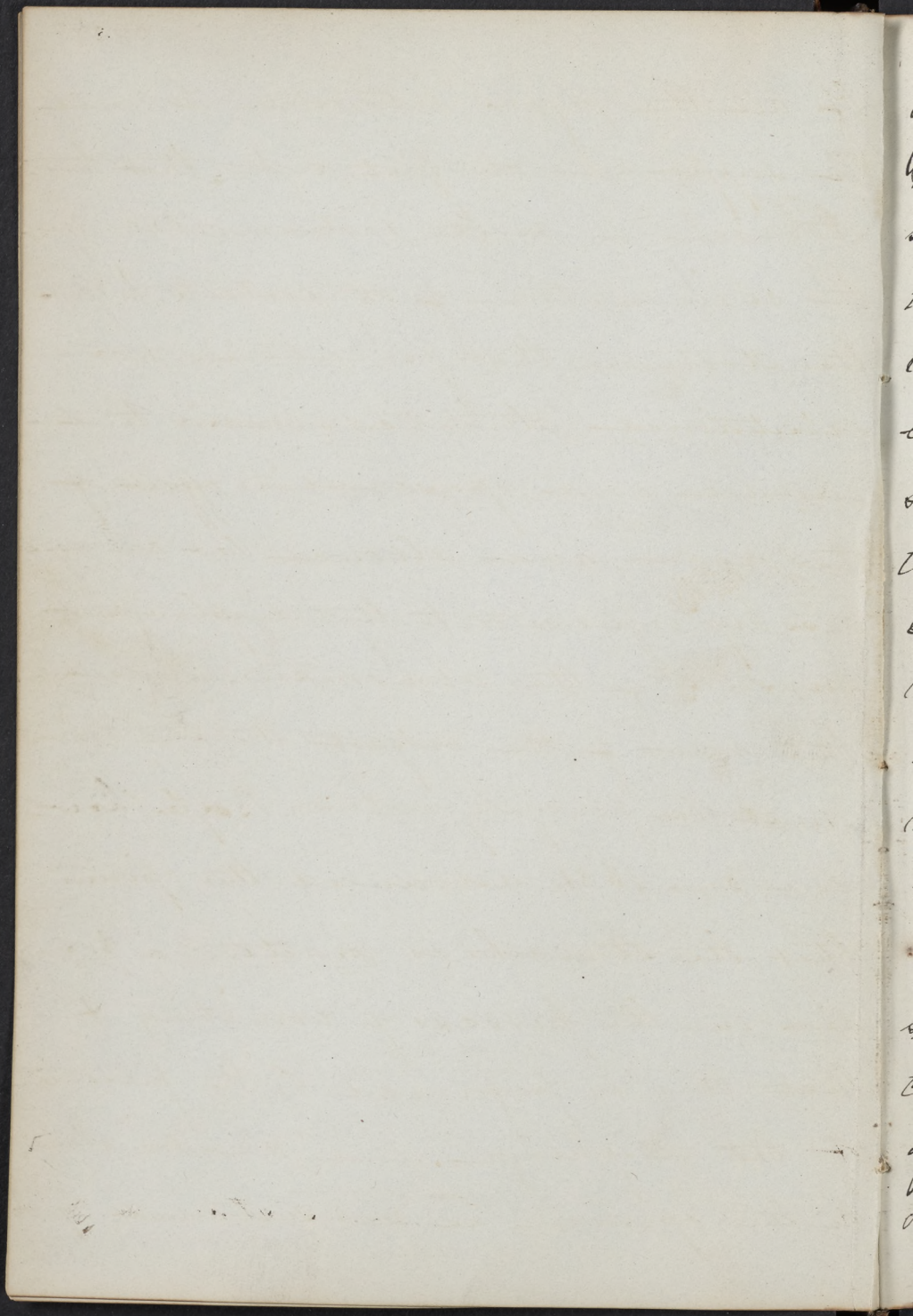
It is an highly complex operation requiring the concert and simultaneous movement of several organs, and therefore especially demanding attentive examination.

Much discussion has been elicited

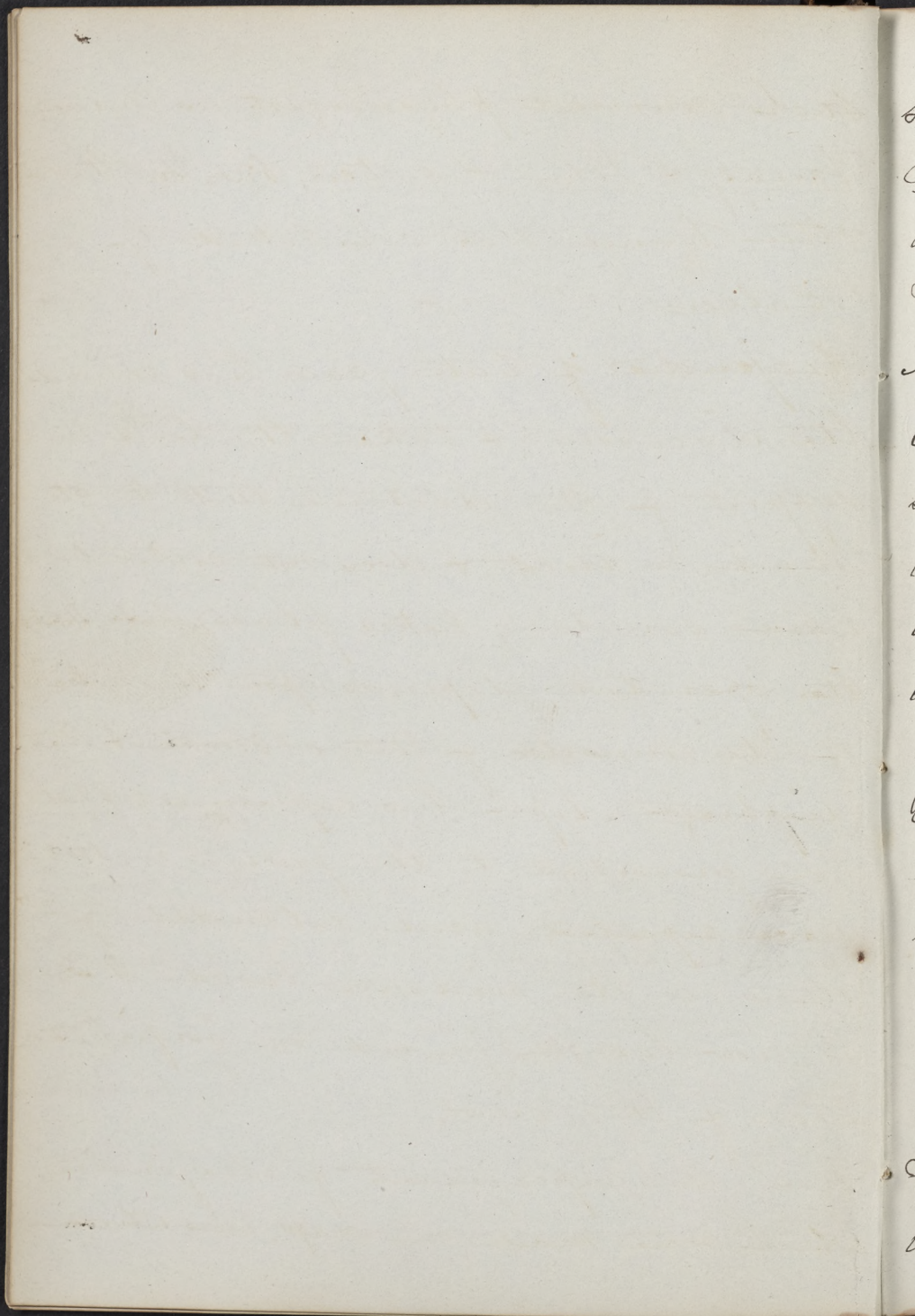
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in the attempt to determine the mechanism of vomiting, and no little perplexity has been occasioned by the conflicting and opposite interpretations of the phenomena presented to observation. To determine the agency of the different organs interested in the operation is of primary importance, previously to an exposition of the combined movements involved in the operation of an emetic.

The organs that are involved in vomiting are the stomach & parts constituting the upper portion of the alimentary tube, the respiratory apparatus, & the media of association, the nervous masses & nerves distributed from them to the organs just mentioned.



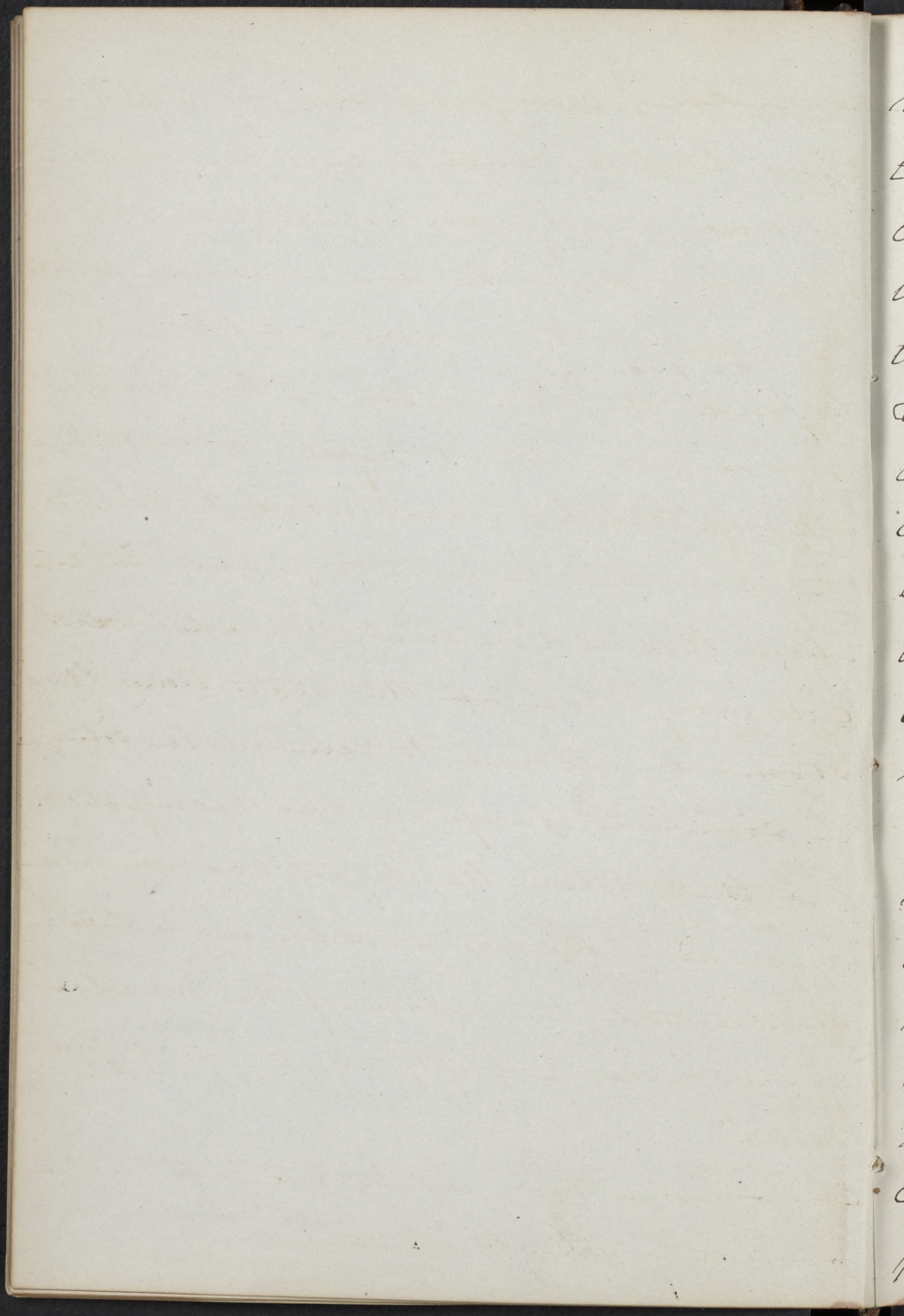
Of all the organs interested, it would be supposed at first sight, that the stomach is most instrumental in the elimination of its contents. Indeed the doctrine that for centuries was entertained attributed emesis to a sudden and spasmodic effort of the organ, and allowed but an accessory influence to the diaphragm & muscles of the abdomen. Under this view of the subject the stomach must be powerfully active. Boyle however in 1681. advanced the opinion that the stomach is inactive or passive in the process of vomiting & that this is performed by the pressure of the diaphragm and muscles alone. In this opinion he was sustained by



such eminent physiologists as Quia
Senac & John Hunter, but on the
 other hand was combated by
Haller

Majendie of later years has revived
 the discussion, & taken the lead in
 support of the doctrine, that the sto-
 mach is inert & does not contract -
 when vomiting takes place, but that
 the operation depends upon the action
 of the muscles of the abdomen & the
 diaphragm. Upon this experiment which
 was presented to the public in 1813 -
 since repeated and extended by
 others is the evidence based that
 is now brought forward in confirma-
 tion of this view.

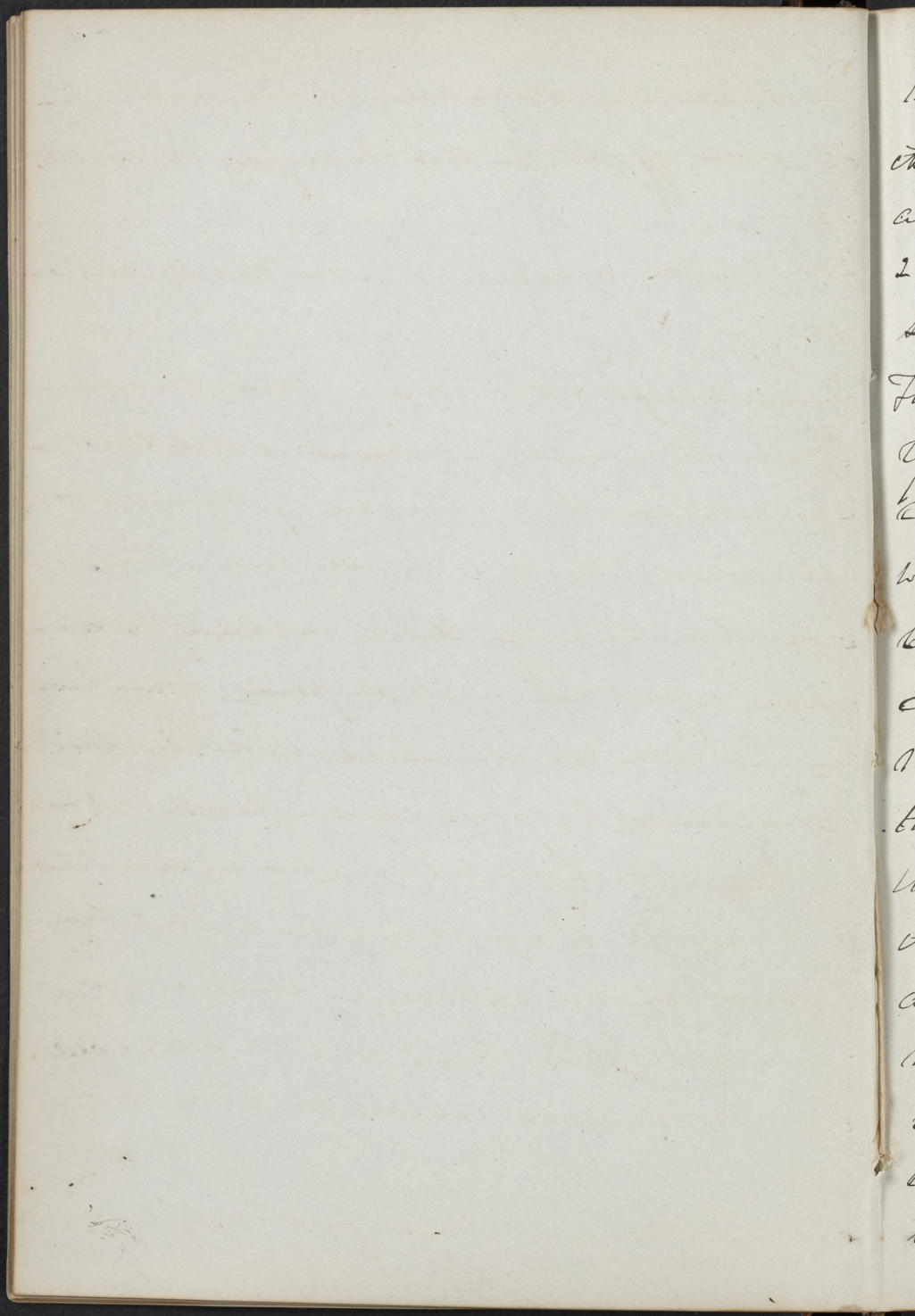
From the experiments of Majendie,
 which were made on dogs, in whom



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vomiting was produced by injecting tartar emetic into the veins, - it was clearly demonstrated that when the stomach was removed from the cavity of the abdomen & placed beyond the action of the muscles, it was not able to expel its contents, - although retching continued to evince the emetic influence, - and that when the abdominal muscles were cut away, - but at the same time the stomach allowed to remain in situ, a similar incapacity was manifested, but that when the organ was removed and a bladder containing water substituted, the action of the muscles was capable of emptying it by compression.

Now from these results two facts are positively established -



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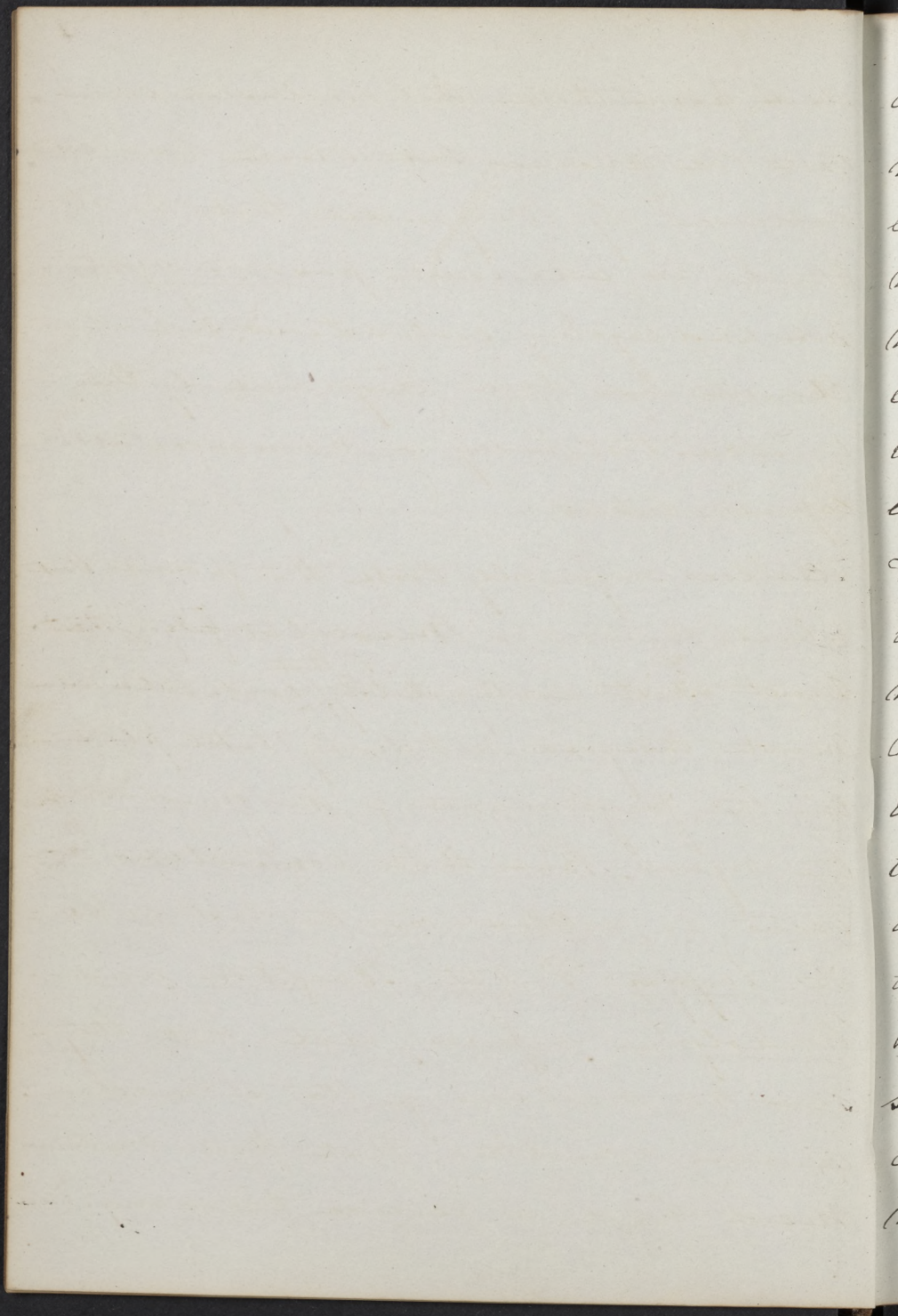
1. That the stomach is incapable, by its own efforts of discharging its contents, and,

2d. That pressure is absolutely necessary. —

The attempts that have been made by Chaignault to invalidate their correctness were deemed by those who witnessed them to be inconclusive. —

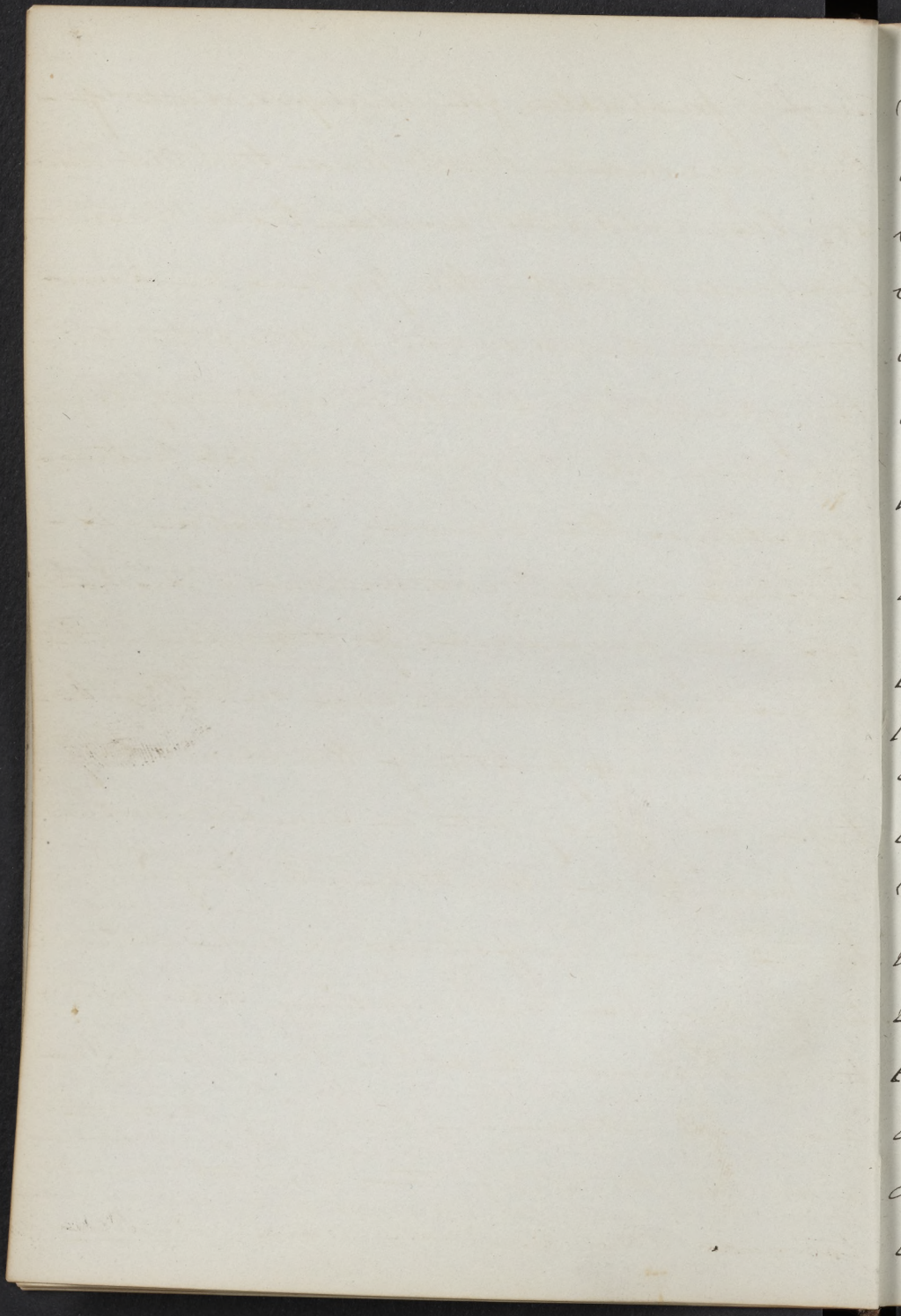
Corroborative of their validity is a case reported by M. Lapine, that has much interest attached to it. In this the stomach protruded through a wound in the abdomen which had divided its parietes & vomiting could not be accomplished, although strenuous muscular exertions were made, until the organ was returned to its position.

Settled then as these facts may be regard-

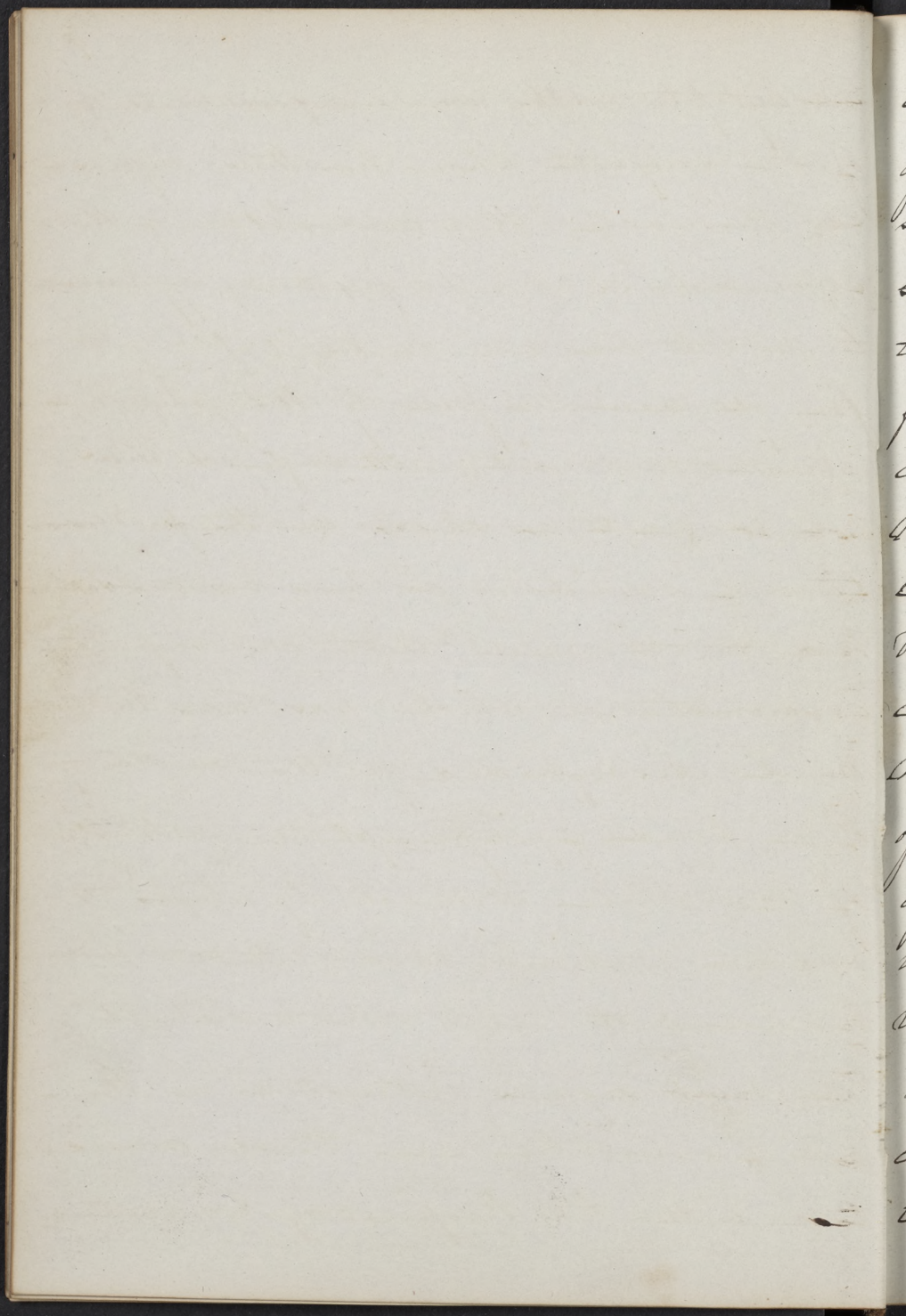


ded, from them the conclusion cannot be drawn, but which has been expressed by Majendie, that the stomach is an inert passive agent not undergoing contractions, such a conclusion has been disproved by the united testimony of numerous able-experimenters.

Haller originally took the ground that where there was muscular fibre, there must exist ^{that} contractility ^{or} contractions - must therefore naturally take place in the performance of the functions of the organ. But that contractions do occur is settled on the best authority. Cropper Porter, Haughton and Rudolphus expressly state that they saw the motions of the stomach during vomiting. That these movements had a reverse tendency is

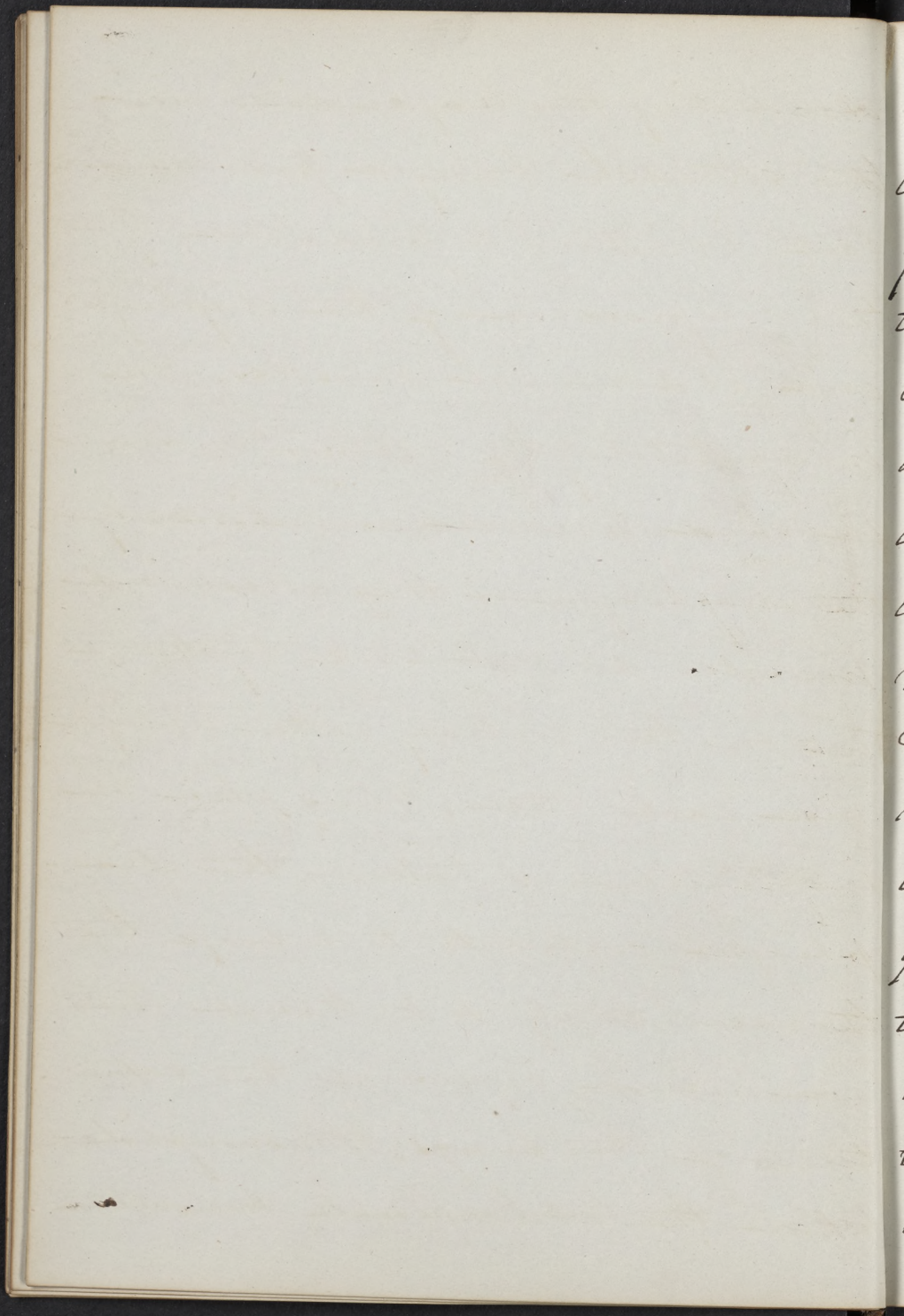


highly probable, for independent of -
 the argument, that had this not been -
 so, the contents would have been -
 expelled through the pylorus, we know
 that the duodenum participates in -
 the operation & bile is constantly regu-
 gated into the stomach, yet further -
 sometimes the small intestine is -
 involved, and stercoraceous dischar-
 ges are produced. If then an anti-
 peristaltic action can exist in the
 continuous portion of the alimentary
 tube, why may not a similar motion
 be present in the stomach itself? -
 weak and ineffective as such contrac-
 tions may be in vomiting, still from
 the statement that has been made, we
 are warranted in believing that it
 aids in pushing the contents forward
 towards the cardiac orifice. Müller

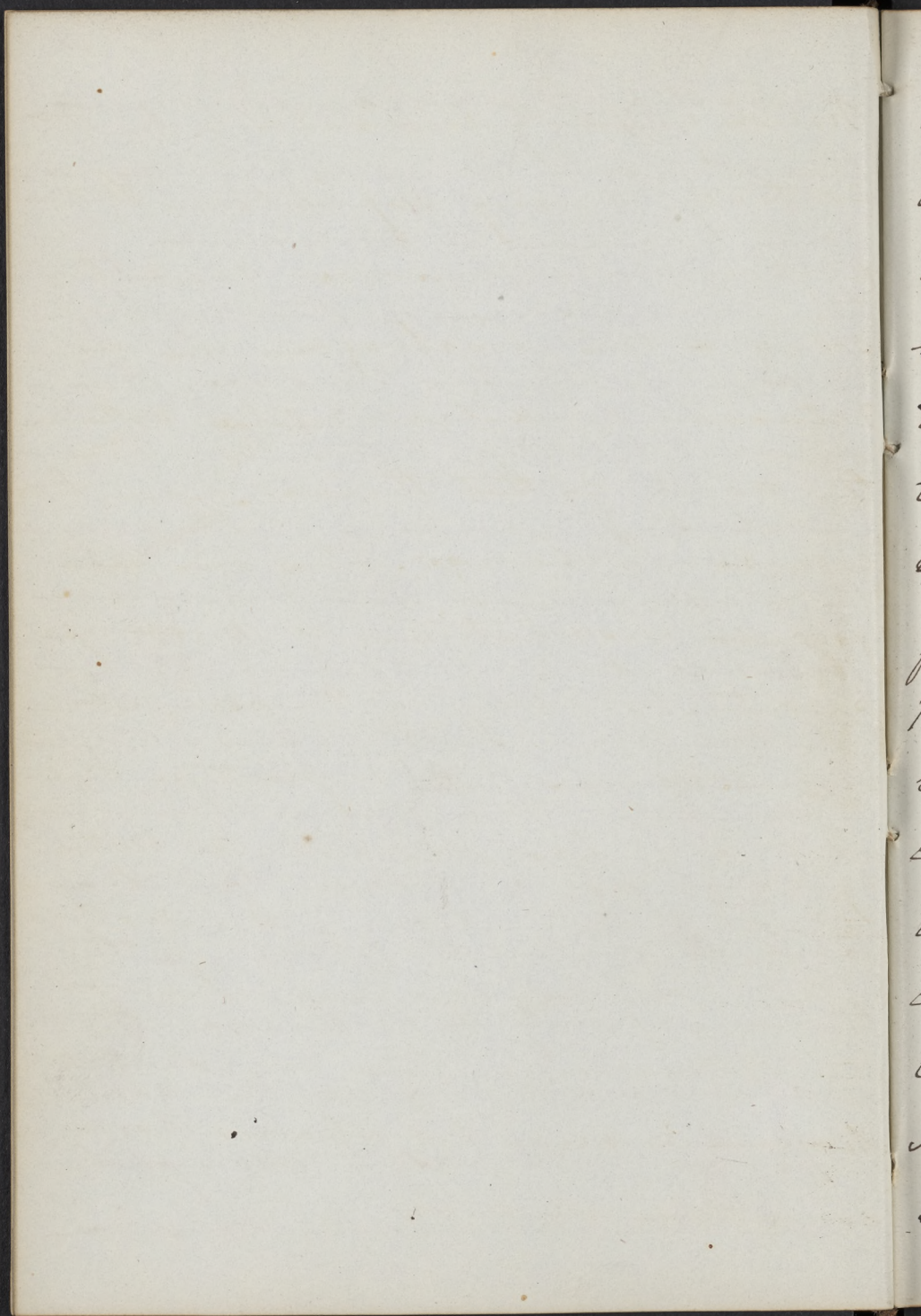


assents to such an understanding of the subject when he thus expresses himself, "the contraction of the stomach during vomiting appears to me to be an indubitable fact, for it can be felt by the person about to vomit, although it has not so great a share in the production of vomiting as has been ascribed to it" and "that an important circumstance, which has been hitherto much disregarded, is the existence of a kind of imperceptible contraction of the whole stomach, by which its volume is diminished, without individual parts being seen to contract"

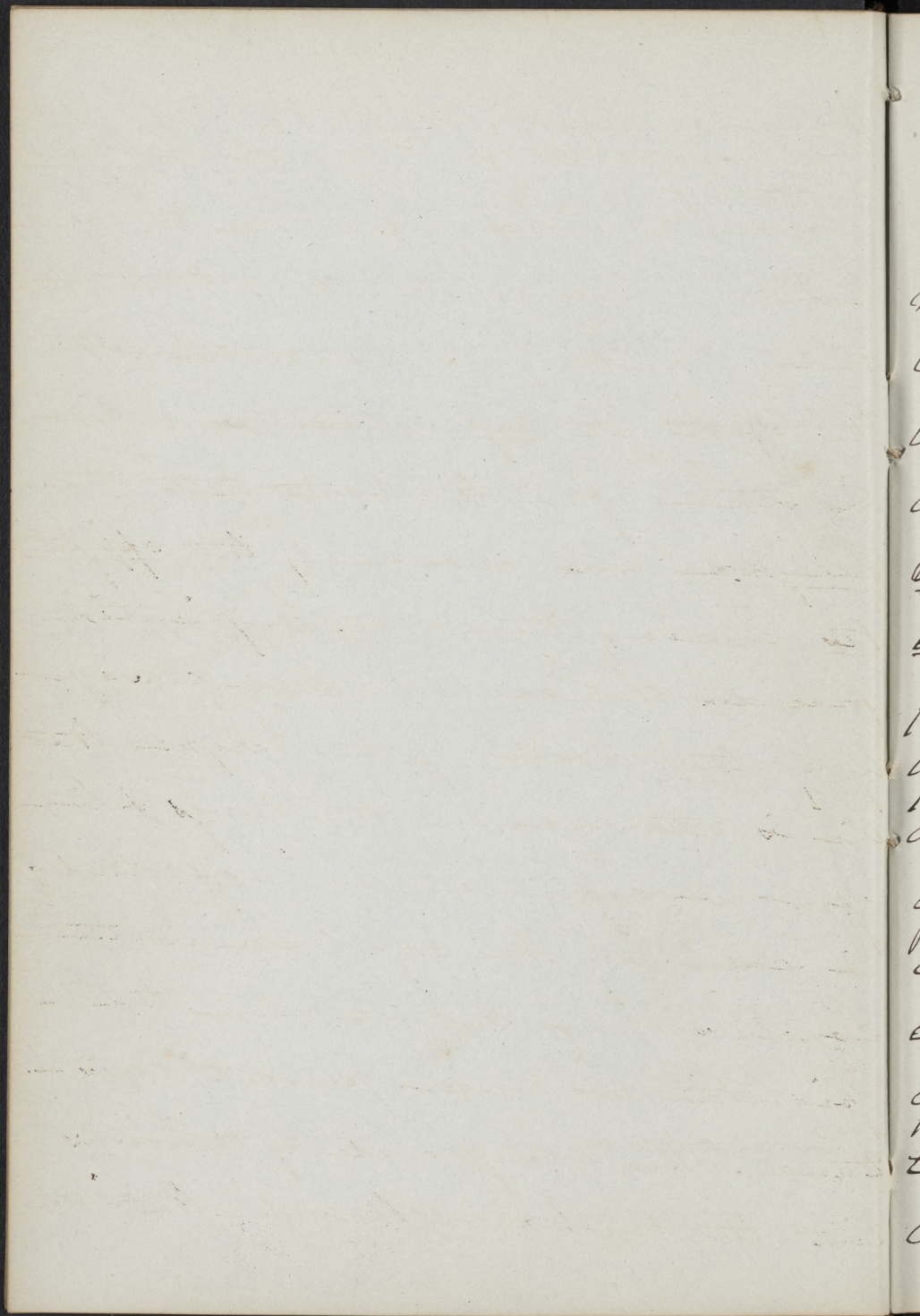
The next organs interested in the act of vomiting are those connected with the Respiratory Apparatus.



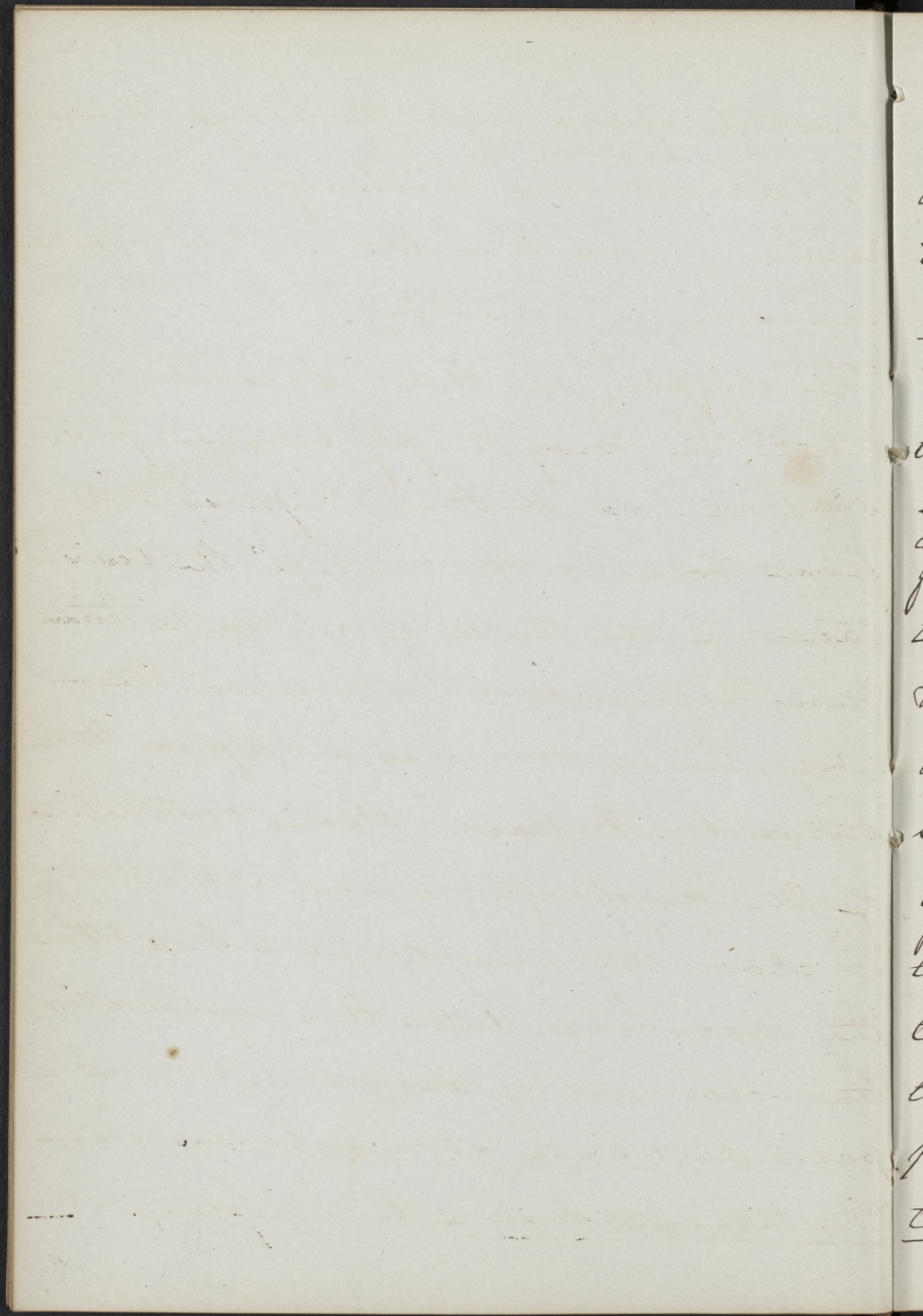
According to Mayendie's view, -
 the stomach being a passive a-
 gent, vomiting is produced by -
 the compression of the diaphragm
 and abdominal muscles. An -
 incompatibility of action is here -
 involved however, as ordinarily -
 the diaphragm & the abdominal
 muscles do not work together, -
 but on the contrary rather antago-
 nise each other. Thus when an
 inspiration is taken, the dia-
 phragm contracts to enlarge the
 thoracic cavity & to thrust the
 abdominal organs at the same -
 time off the lungs, to accomplish -
 which the abdominal muscles -



must yield by relaxation. On the
 contrary, during expiration the
 abdominal muscles exert them-
 selves & the diaphragm in a re-
 laxed condition retires within
 the cavity of the thorax upon the
 collapsing lungs. This in a
 forced inspiration is most ap-
 parent. Vomiting is therefore not
 simultaneous with inspiration. Which
 idea is inseparable from the doctrine
 that the contraction of the diaphragm
 is necessary for the compression of
 the stomach. In thus regarding it
 Mayendie and his followers have
 committed an error.

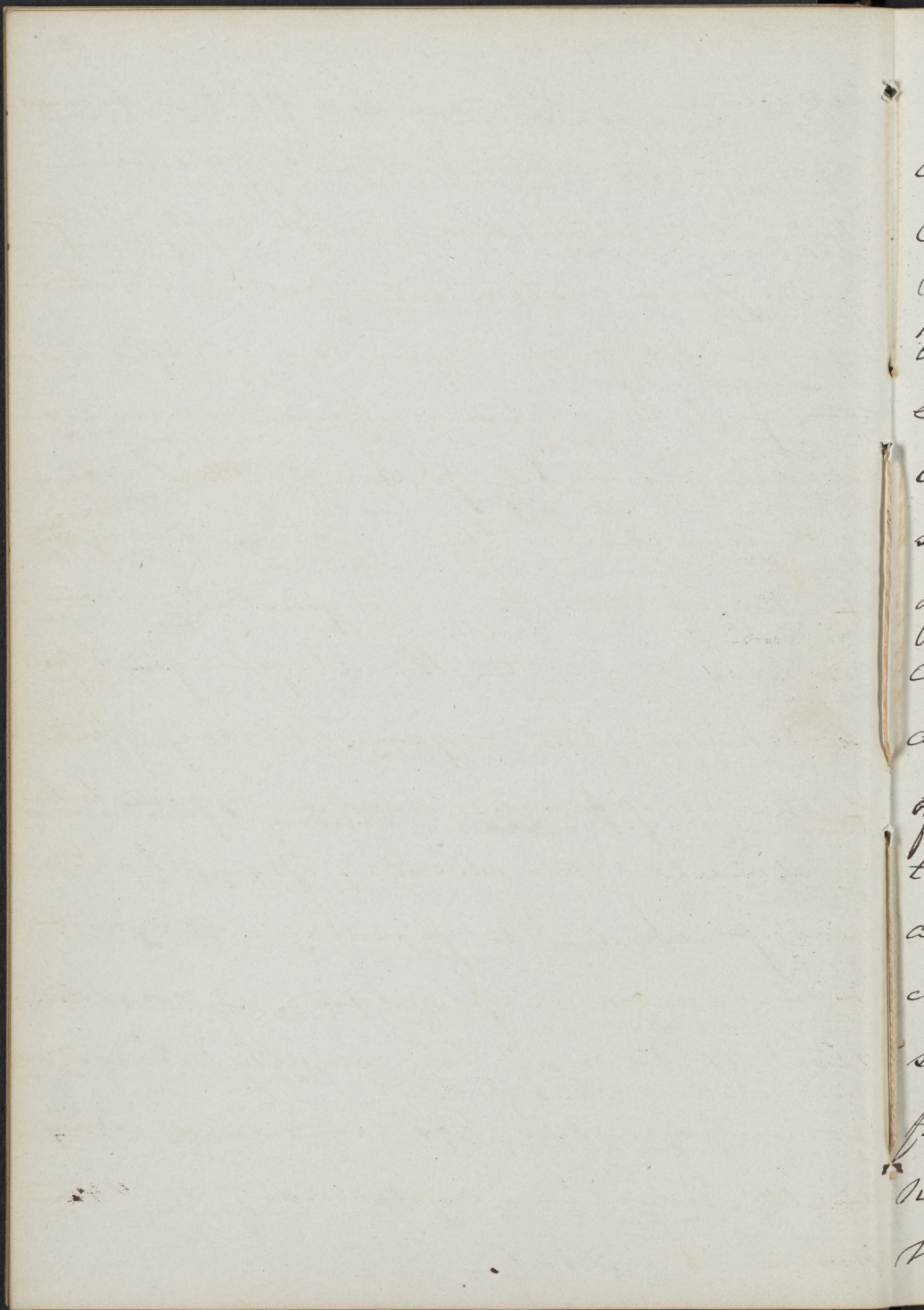


The researches of Dr Marshall Hall
 appear to have presented the expla-
 nation most consonant to truth. His
 views admitting as connected with
 the effort at expiration, and first
 insisted upon the fact that the
Larynx was closed by the epiglot-
tis during the act. Inspiration
 precedes the exertion, and consequent
 ly by the closure of the Larynx the
 air is retained in the lungs, & the
 effort at expiration is ineffectual;
 it can only be expelled at the
 conclusion of the act, when the
 epiglottis no longer presents resis-
 tance. This was proved by incisions
 into the trachea & through the isthmus

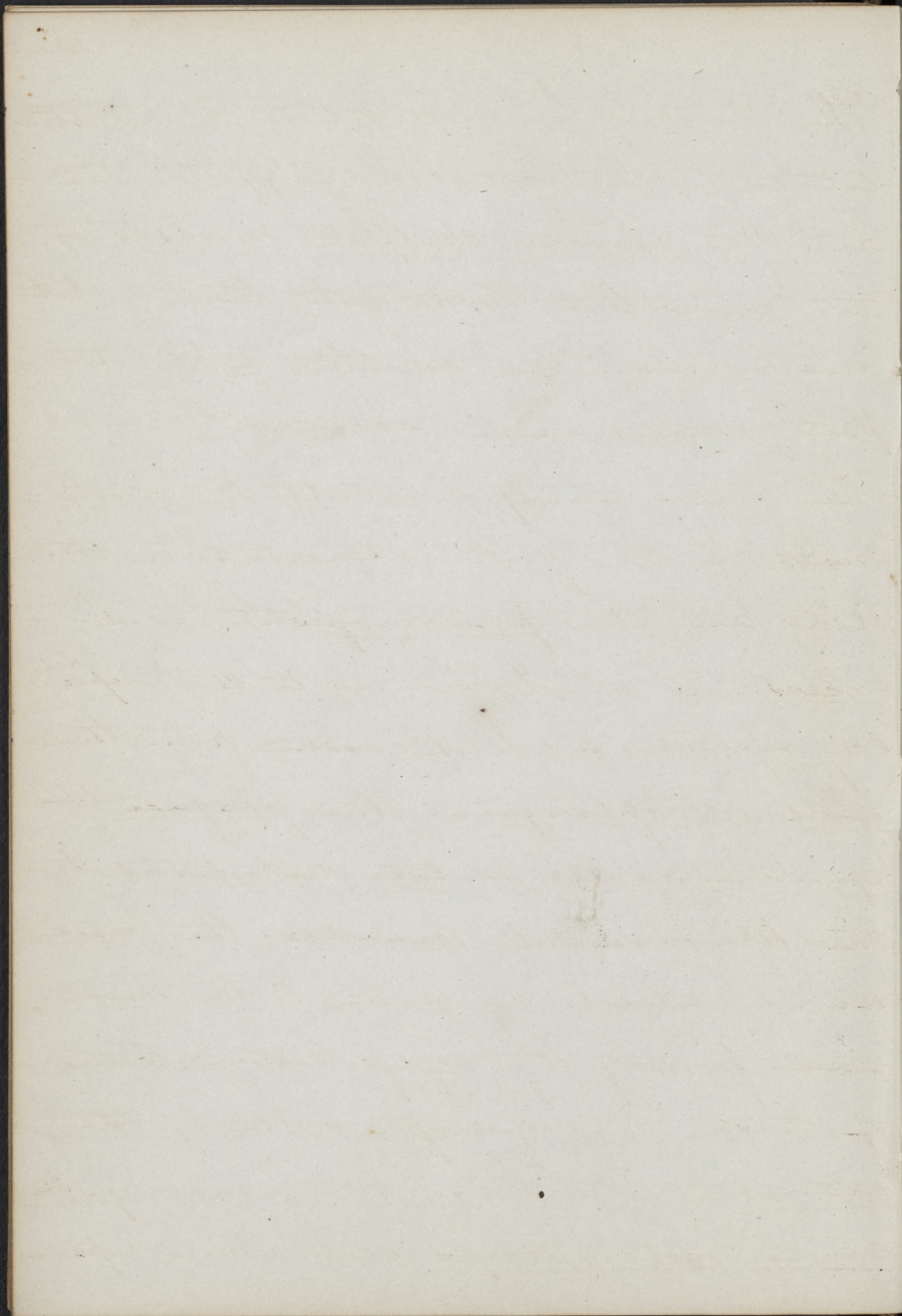


costal spaces into the lungs, through which air was discharged when retching was brought on, but without occasioning vomiting.

The diaphragm then does not contract, it may simply remain passive or as Dr. Keale expresses it "float between the cavities" the resistance of the bulk of air in the thorax being sufficient to antagonise the abdominal muscles & compress the stomach. Indeed strong contractions of the diaphragm would rather tend to close the oesophagus & thus retard the operation. With this explanation, the occurrence of vomiting in a patient whose stomach was on the thoracic side of the diaphragm —



Reported by Dr Graves & Stokes, becomes
 intelligible without the supposition
 that the stomach must empty itself
 by its own contractile power, which
 would at first view be uncertain-
 ed, for the abdominal muscles
 could as easily press upon it, or
 so draw down the inferior margin
 of the chest to accomplish the same
 compression, with the diaphragm before
 as behind the organ. The only office
 of the diaphragm would appear to be
 to dilate the chest; after which
 accomplished, its function ceases &
 it becomes inoperative; a conclu-
 sion that may be equally derived
 from Majendro's positive and Maignan's
Nault's negative experiments to deter-
 mine its activity.



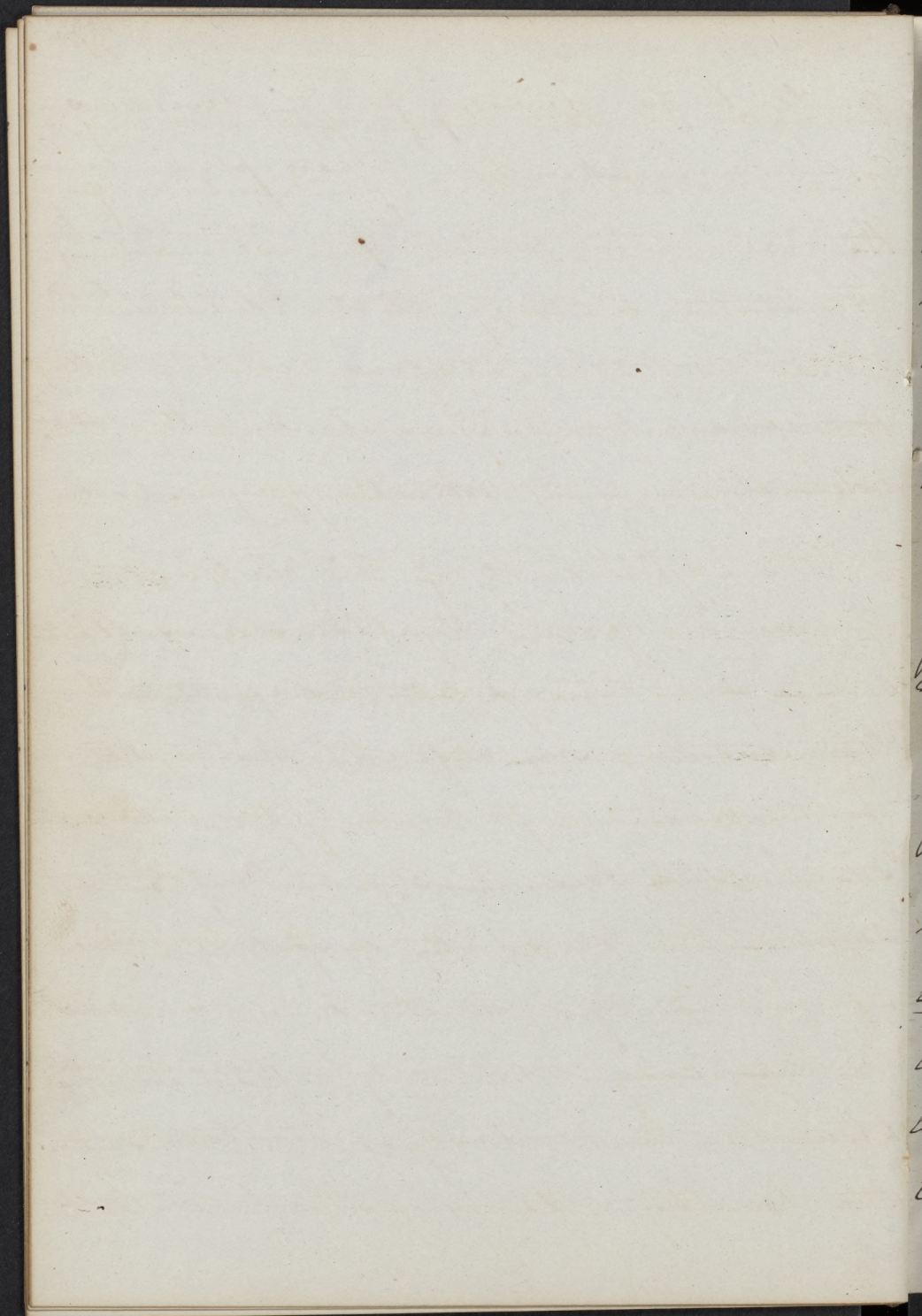
The last organs mentioned as interested in the operation of an emotion - are the nervous central masses & the nerves that issue from them, by which an harmonious execution of all the parts concerned, is secured.

The nerves which regulate the movements of the parts interested in vomiting are the pneumogastric and accessories which belong to the respiratory system & which issue from the Medulla oblongata; the phrenic & spinal excito motor distributed to the Abdominal muscles; the trifacial branch which is given to the throat, and finally the sympathetic. Some of these are indispensable to the act, while others are but accessory. The excito motor nerves seem more espe-

These are the respiratory nerves, the -
trifacial & spinal nerves as has been
mentioned

cially to be necessary, for if nervous-communication be interrupted in them, vomiting is impracticable. By the cacito motary nerves is understood all those contralling the muscular movements occurring during the act. The share of influence appropriated to the sympathetic is obscure.

Of course communication is essential to the operation, & physiologists now regard it as of reflex character. The impression is made upon the stomach & through the par vagum & as Haller thinks the sympathetic is communicated to the brain and spinal cord, whence by reflected action the parts involved are roused into action. This has been deter-



ruined by the effect of dividing, and irritating the upper portion of the paravagus, which occasioned vomiting, & also of what Shutter states as the analogous result of cutting the splanchnic branch uniting the celiac ganglion with the spine.

Independently of the destruction of nervous power by division of the nerve & a consequent obstruction to the action of emetics, the participation of the brain is proved by numerous circumstances. Thus, from the suspension of the sensibility of the sensory commune by narcotics, or as occurs in Apoplexy emetics will not operate, while on the contrary disturbance of the healthy actions of the brain will

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Be reflected upon the stomach & cause emesis, as for instance a blow upon the head, more especially the hinder portion as occurs often in children, swinging, & sailing on rough & troubled waters.

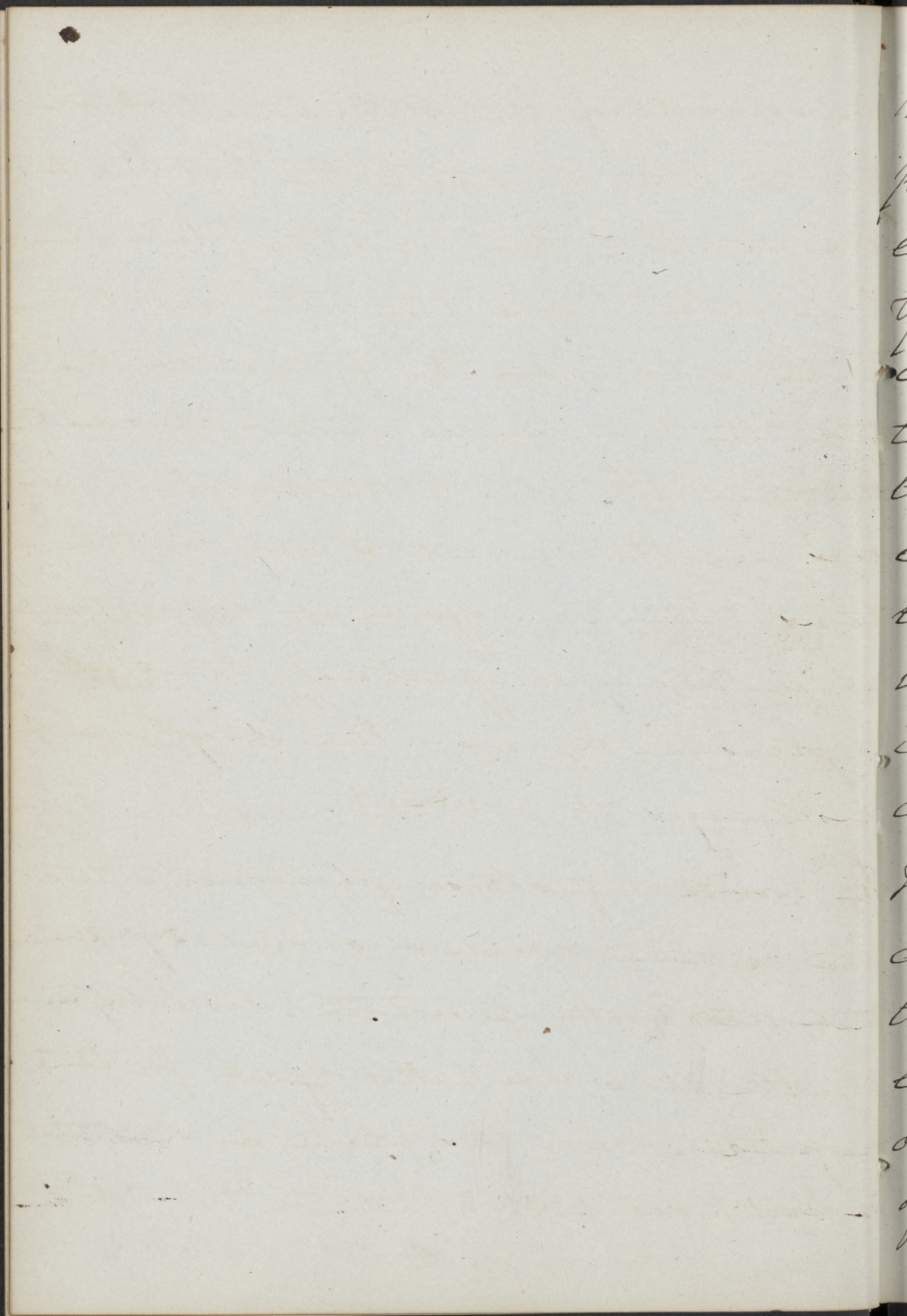
Remote sympathies will likewise produce vomiting, as in the case of injury to the testes, strangulated hernia &c. But the most curious is from irritation of the fauces, which must be strictly confined to them & the palate, for if the irritating body (a feather for example) be brought in contact with the pharynx, it will provoke swallowing. The feather used for this purpose has often been taken into the oesophagus from the impression on the pharynx.

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The individuals in whom such idiosyncrasies are exhibited are for the most part of excessively impressible constitution. They afford proof however of the close nervous communication & sympathetic relation between the organs.

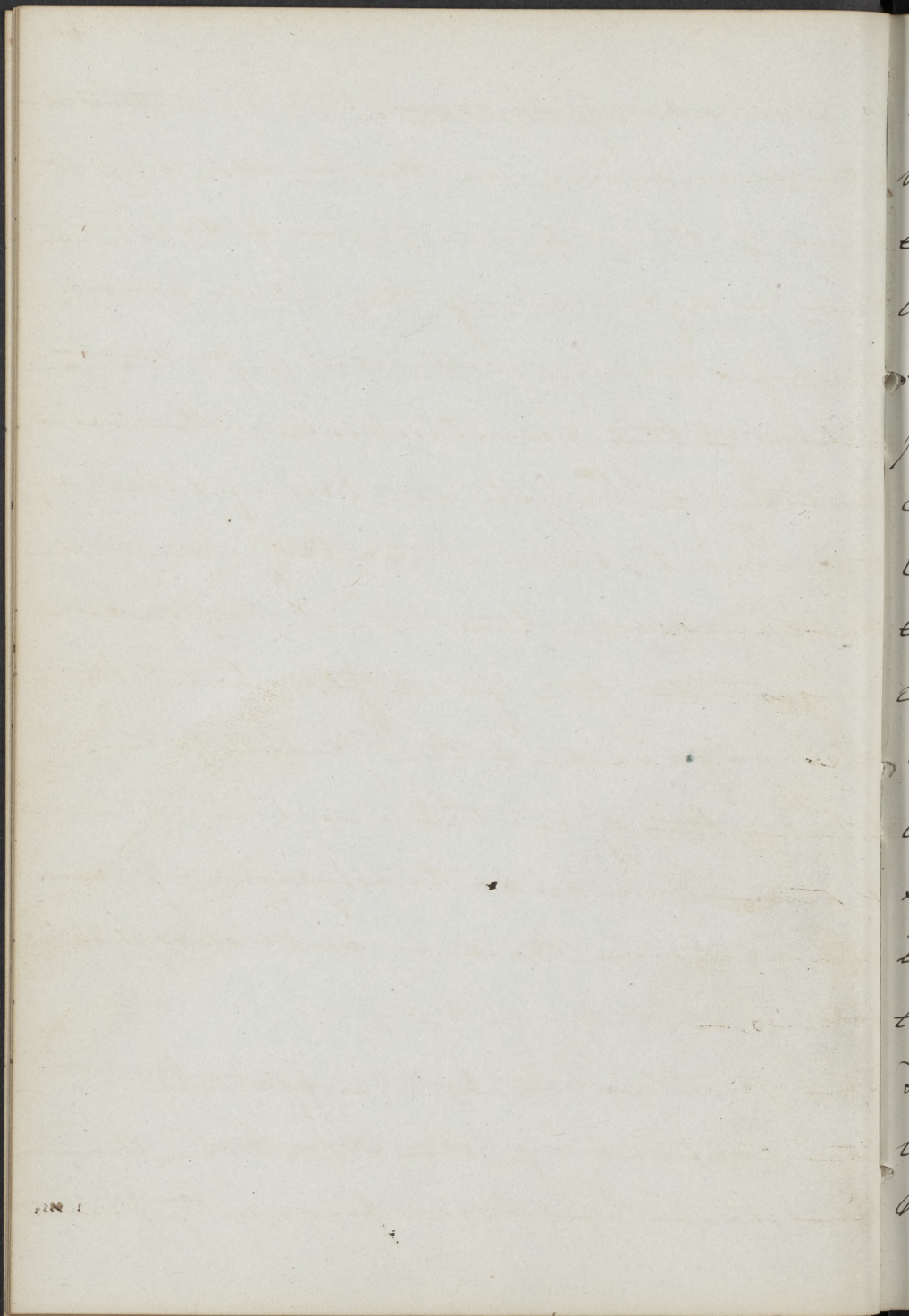
Fainting from loss of blood & sometimes opium will occasion vomiting. Besides these causes of it, there may be an origin as purely nervous in character, as in cases where it is produced by mental impressions or upon the organs of sense. Such are the recollection of, or sight - Taste or smell of disagreeable objects.⁺

Having now discussed the different questions concerned in the act of vomiting, let us distinctly state the several steps of the operation & by this recapitulation bring them into a condensed summary. - An impression is made upon the stomach, which is communicated to the brain and spinal column & reflected back upon that organ & the respiratory apparatus. A contractile -



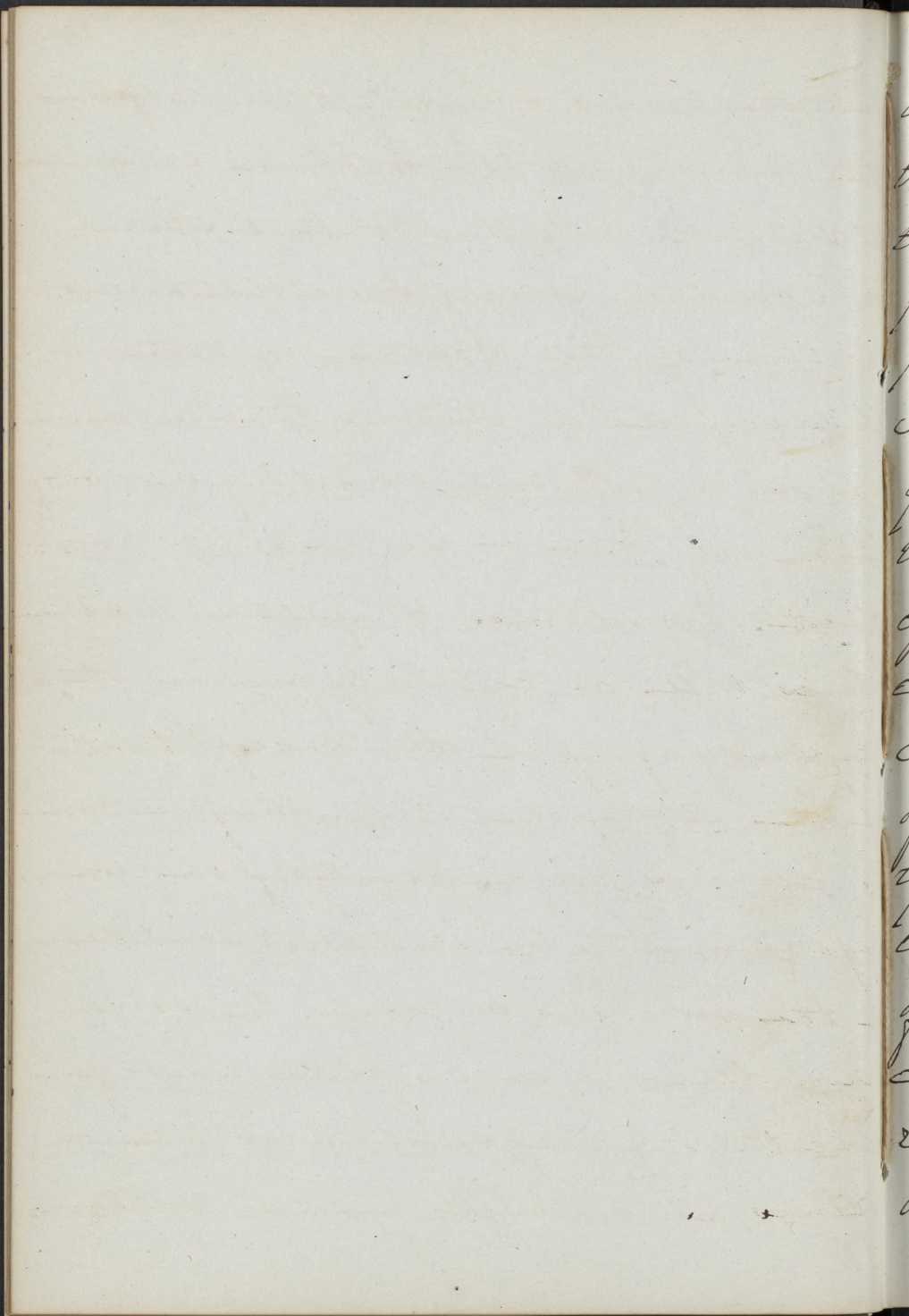
Movement of the stomach takes place, with closure of the pylorus & expansion of the cardia, followed by a full inspiration; the palatine arch is raised, the fauces constricted, the Larynx elevated & closed by the epiglottis. The abdominal muscles are thrown into strong contractions, with an effort at expiration which being ineffectual, the stomach is pressed against the diaphragm & discharges its contents.

In union with these phenomena, there are certain local & general symptoms that are worthy of notice. Usually an emetic does not take effect for ten or fifteen minutes, when a sensation of sickness of stomach is felt, which

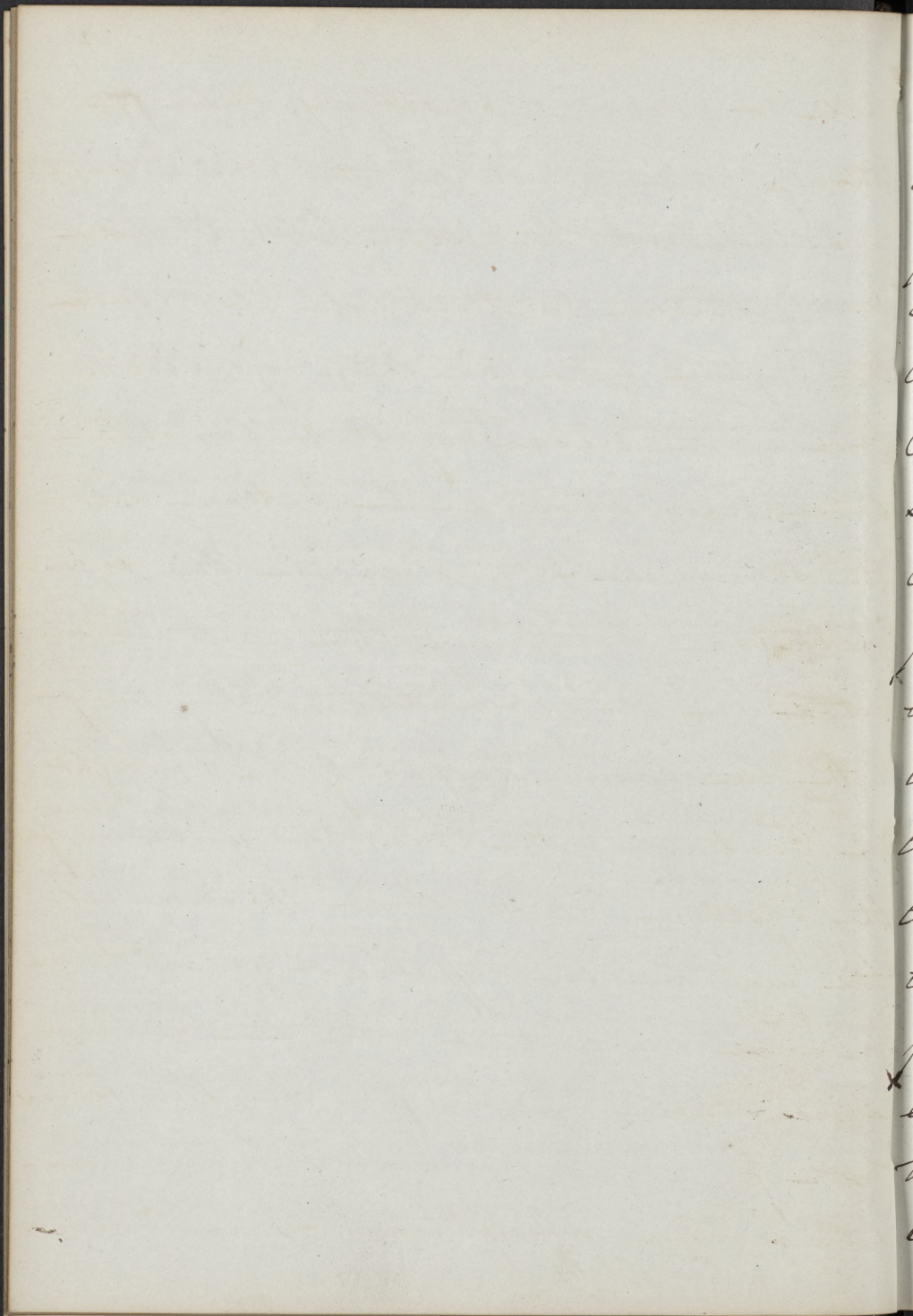


is termed nausea, this is attended with swimming in the head, a quivering of the lip, - a flow of saliva, - and a depression of the vital powers, - manifested by feebleness of pulse & palor of the countenance, with condensation of moisture. During vomiting the circulation is perturbed and embarrassed, the head becomes congested, the face flushed, the eyes suffused & the pulse full. - When the operation is over, the system becomes tranquil & from exhaustion there is a disposition to sleep. -

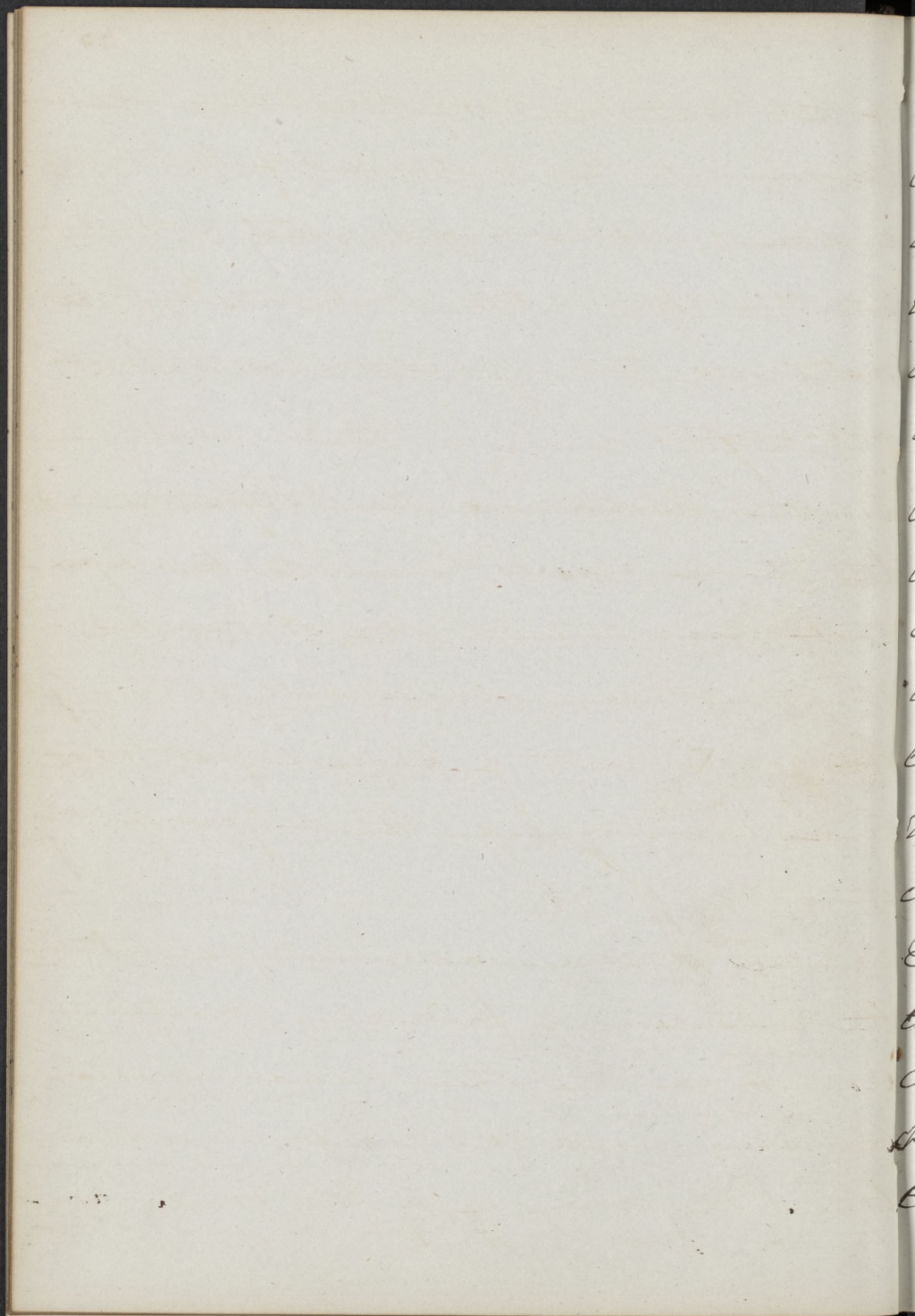
The matters that are ejected are the contents of the stomach, the bile that has been forced by pressure



into the viscous & Lastly mucus from
 the Bronchi & trachea. In some cases
 to I have not doubt that the
 pancreatic juice constitutes a
 portion of the ejected matter.
 Medicinal substances that are
 given to produce vomiting are not
 those only that occasion such an
 effect. Sometimes purgative medi-
 cines will as certainly produce it,
 depending upon the susceptibility
 of the stomach, which may be pure-
 ly nervous, or originating in an
 inflammatory or irritable condition
 of the mucous surface. In some
 cases there is a complete want of
 retention of all substances, even
 drinks, as a draught of cold water -



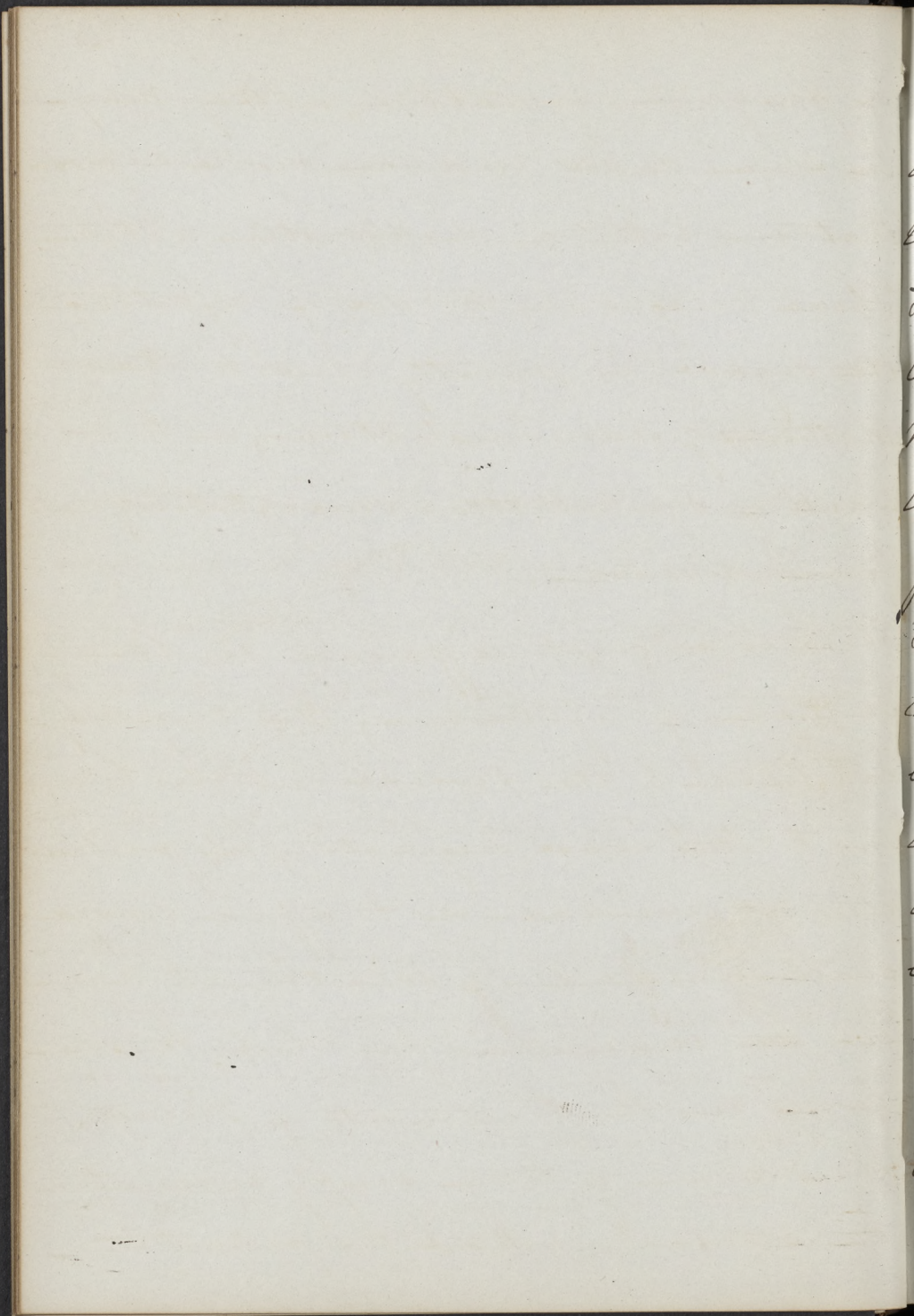
will occasion vomiting. Bile of
 itself will produce it when regur-
 gitated into the stomach. Crude
 indigestible matters will also rouse
 the organ & cause their ejection.
 Or is it necessary that emetic
 substances should be taken into
 the stomach & thus excite the sym-
 pathetic action of the parts inter-
 ested in the operation. They may
 with the same certainty be brought
 in contact with remote portions of
 the system. Thus when thrown into
 the rectum in sufficient quantity or
 placed in contact with the skin,
 emesis will be brought on. This occurs
 both from the nervous communica-
 tion & from absorption. As an instance



of the first we may mention Tobacco-
 thrown into the rectum & of the second-
 Tartar emetic inordinately rubbed
 into the skin as a revulsive. In these
 instances the reflex action is most
 apparent.

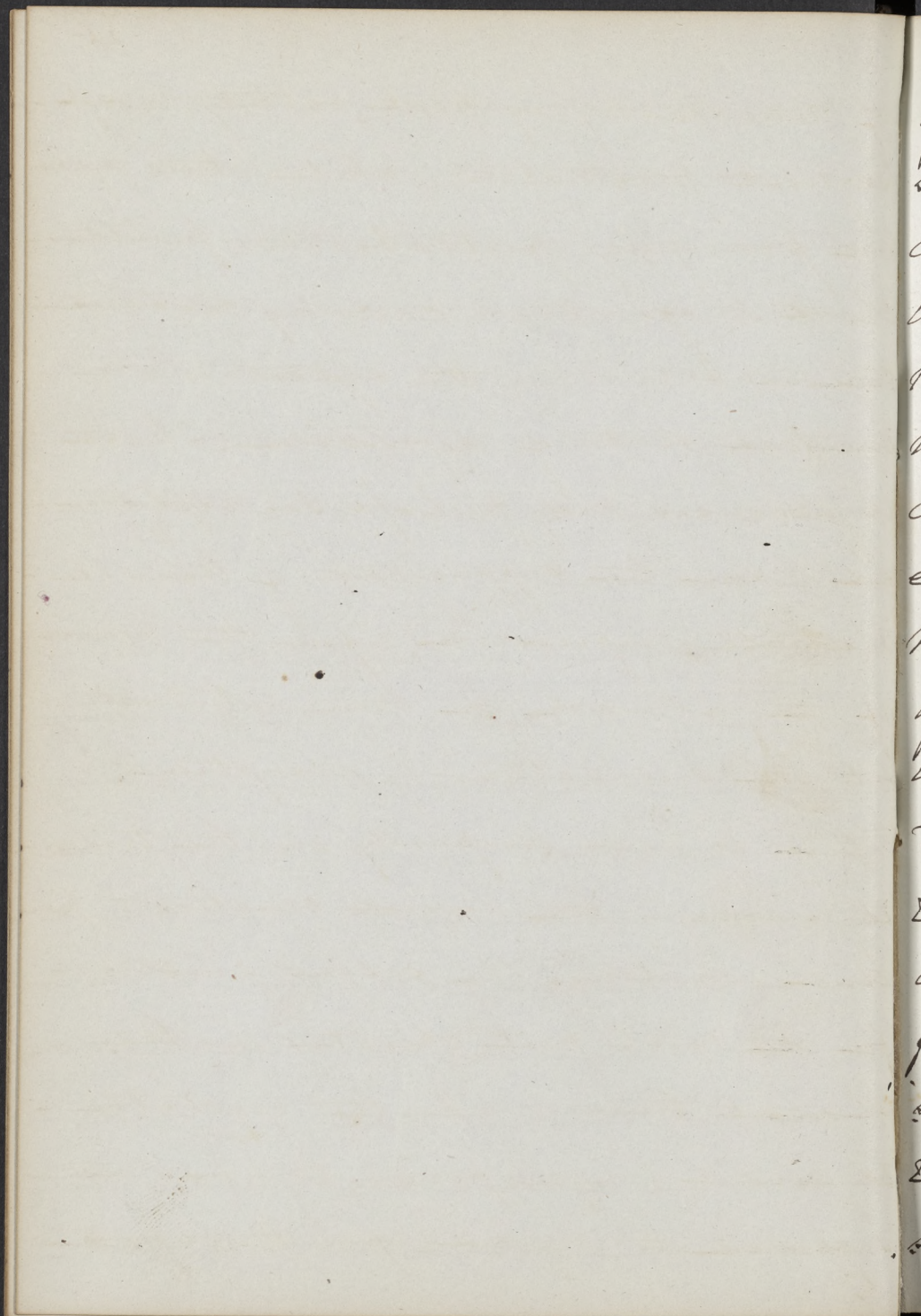
Emetic substances when injected into
 the blood vessels, have also an espe-
 cial direction to the stomach, -
 this has been abundantly shown by
 the experiments of physiologists who
 have investigated the subject of vom-
 iting

Emetics that are administered with-
 the intention of producing vomiting -
 do not on the other hand invaria-
 bly bring about this result. Thus some-
 times they run off by the bowels from



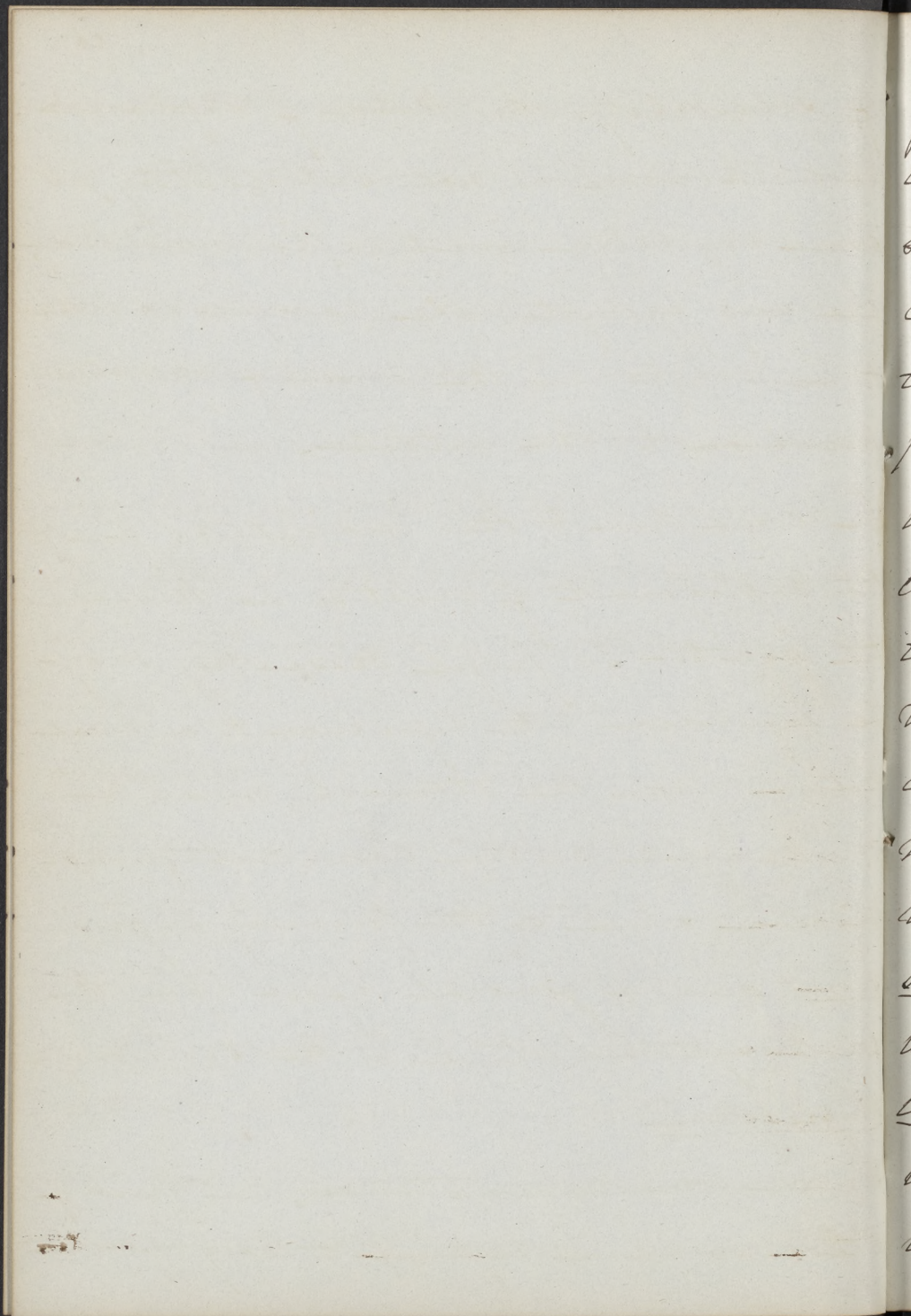
a purgative operation, or they may in some cases induce violent prostration, with a diaphoretic action. These irregular modes of affecting the organs is mostly due to the method of administration, or to a want of sympathetic susceptibility from disease.

There is a great difference in the manner of influencing the economy exhibited by the several articles belonging to this class, originating in peculiarities so decided as to afford considerable latitude of selection to carry out the indications for which they are given in the treatment of disease. Thus some of them simply evacuate the stomach, without the production



of nausea to any great extent, or subsequent prostration, while others again are powerfully perturbative, forcible in their operation, causing excessive nausea & leaving the system in a marked state of depression. These differences may perhaps be explained upon the supposition of their immediate impression upon the nerves of the stomach, or their introduction into the circulation by absorption.

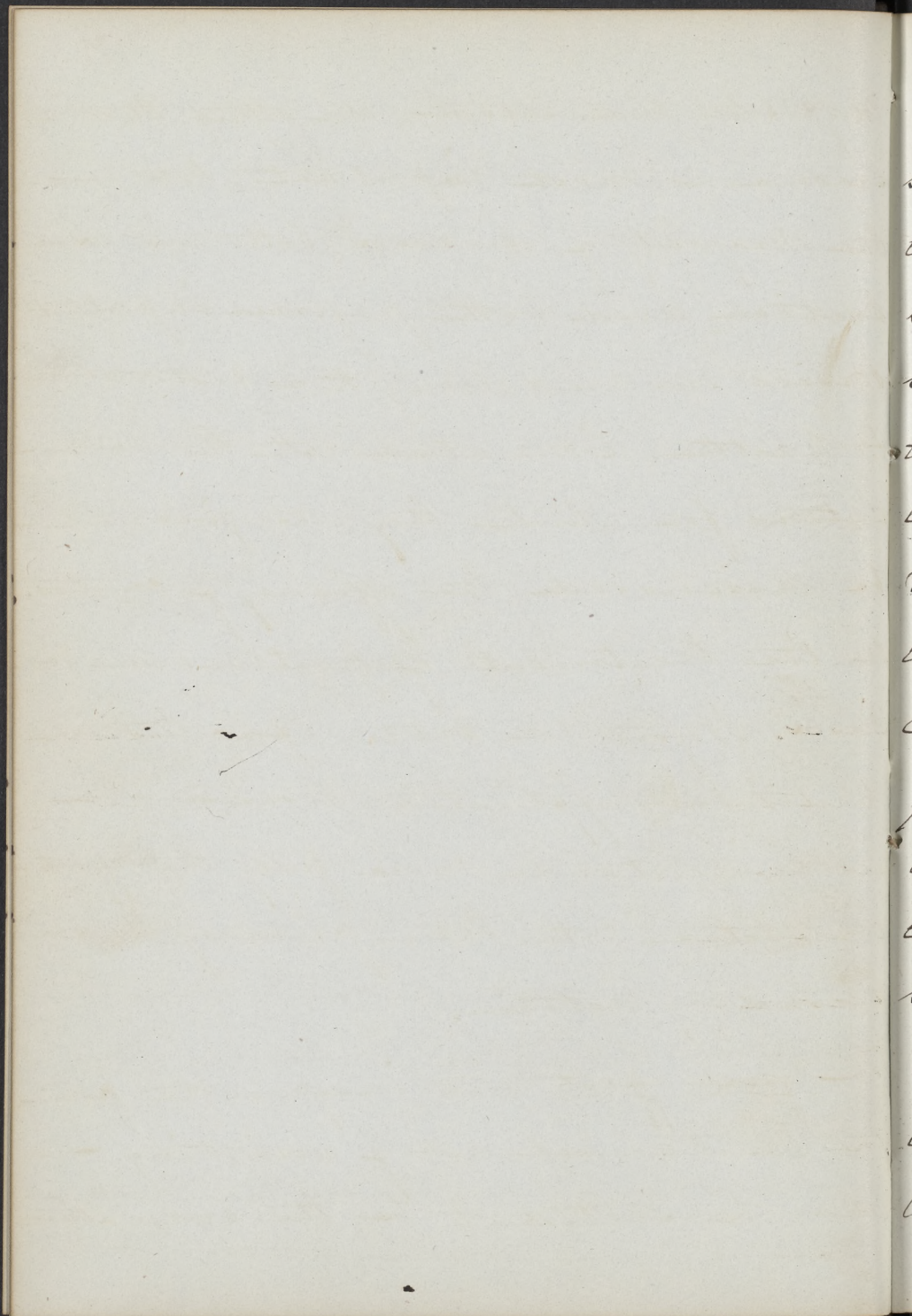
There is also disparity in the time required by the several emetics to produce vomiting. The saline emetics for the most part operate in the shortest time, while the vegetable require a longer period; this has been supposed to depend upon the difference



of solubility. This kind of explanation however is not satisfactory, as some vegetable emetics, as Mustard, are very prompt. The reason is rather to be sought in the mode of operation peculiar to the article.

We come now to the indications for the employment of emetics as therapeutic agents. - To fulfil these they may be regarded with reference to a local action upon the stomach, and a mechanical action upon contiguous viscera which is the primary impression and a general effect upon the whole system which is the secondary impression.

Under some circumstances, the first of these is alone required to carry out the



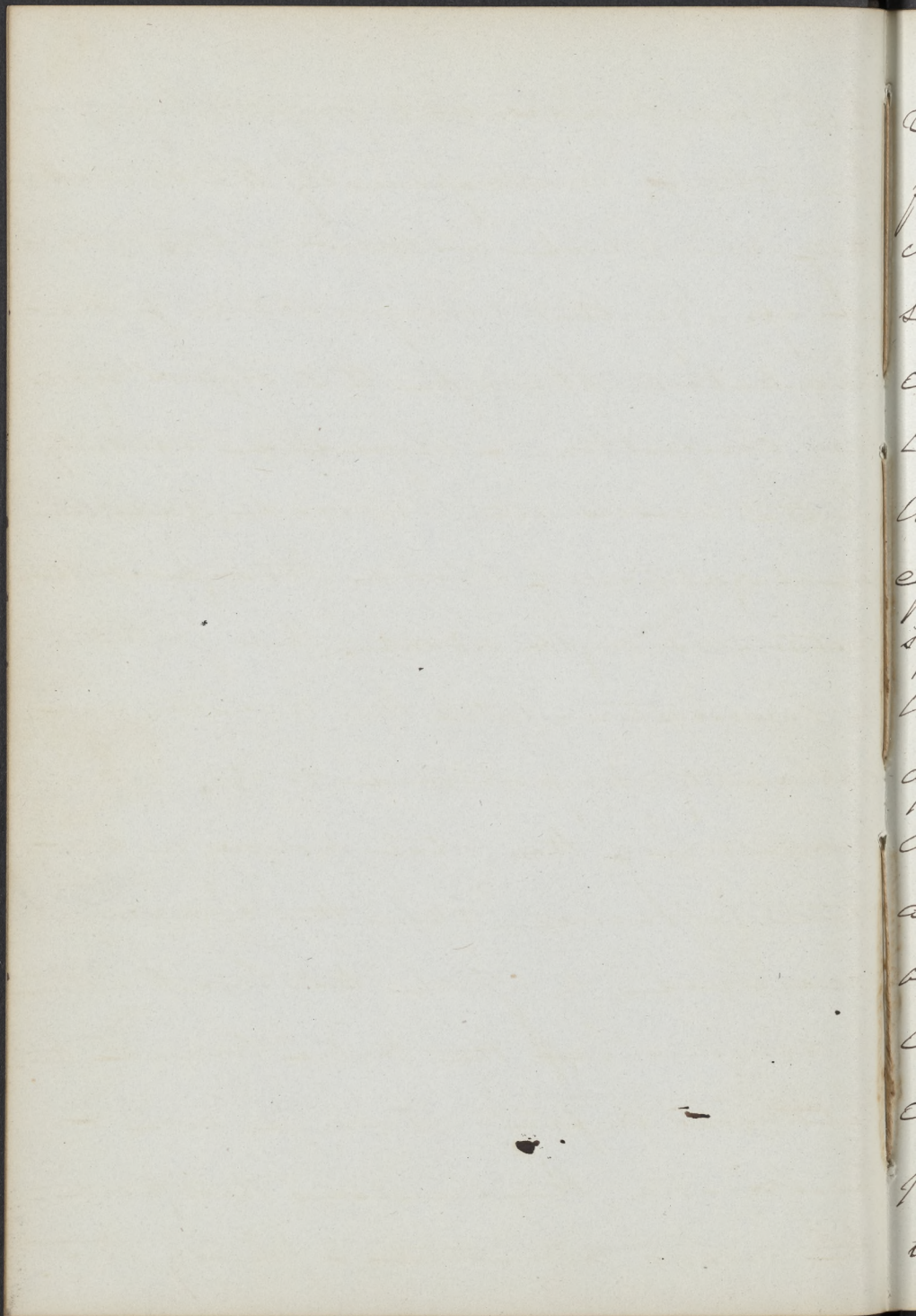
Requisite indication. In others the second is most important, but in the majority of diseases, both are essential, and both perform important service in conducing to a restoration to health. Connected with the indications for which they are given, will be discussed the efficacy of emetics in the treatment of particular diseases. Before we enter upon their particular application however, let us understand more fully the effects connected with their primary and secondary action.

The first effects are inseparable from the mechanical act of vomiting & may be stated to be, the evacuation

The matters vomited are the ingesta-
that have been taken into the stomach,
the secretions from the mucous surface-
in some cases gastric fluid, and to-
wards the termination, if the retching-
be prolonged, bile of a yellowish or
greenish colour. The evacuation from
the lungs is of mucus.

of the stomach, the unloading of
contiguous viscera, as the liver with
its gall bladder, the pancreas, the
impulse given to the portal circula-
tion & the expulsion of matters that
may exist in the lungs & pulmonary-
apparatus & in the organs of defecati-
on, all of which are effected by the
pressure & concussion.

The secondary effects are partly owing to
to the mechanical impression; and
partly to the peculiar powers of the
substance that may be employed &
from this arises the difference that are
exhibited. Thus by the removal of
the matters thrown off from the secre-
ting organs enumerated, free secretion
is permitted, & the mucous surfaces are



left unembarrassed to perform their
 functions, more especially the stomach-
 itself, in which a new action is
 set up. By the invigoration of the
 circulation through the organs, capil-
 lary congestion & impeded activity
 in the vessels are removed, and an
 equalization of blood throughout the
 system brought about. But further,
 in connection with the nausea, and
 apparently proportioned to it, is a
 depression of the vital powers, a sed-
 ative influence upon the economy-
 occasioned, by which the heart's action
 is diminished, the pulse lowered, the
 cutaneous surface rendered cool &
 perspirable, the secretions throughout
 the organs promoted, & finally the

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absorbents quickened in their operation, upon the effects that have now been exhibited are based the indications which are, -

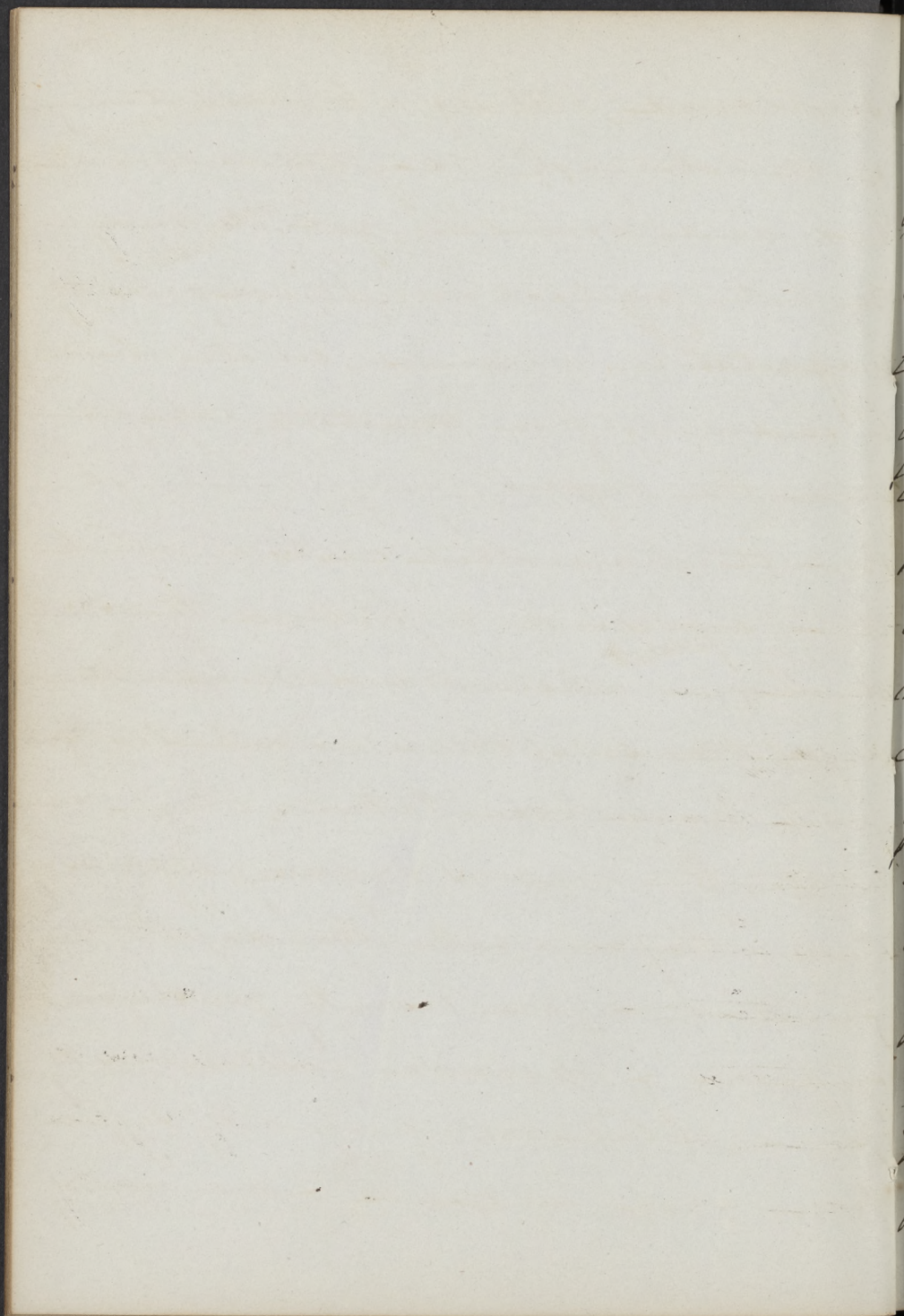
I. To evacuate the stomach.

The evacuation of the stomach becomes highly important in some cases, & even upon its speedy accomplishment may the life of an individual depend. For example - where narcotiz or other poisons have been taken. The emetic substance should in such case be selected from those that act most promptly and at the same time efficiently. - Where narcotics have been taken it is important to recollect that the susceptibilities of the brain have been

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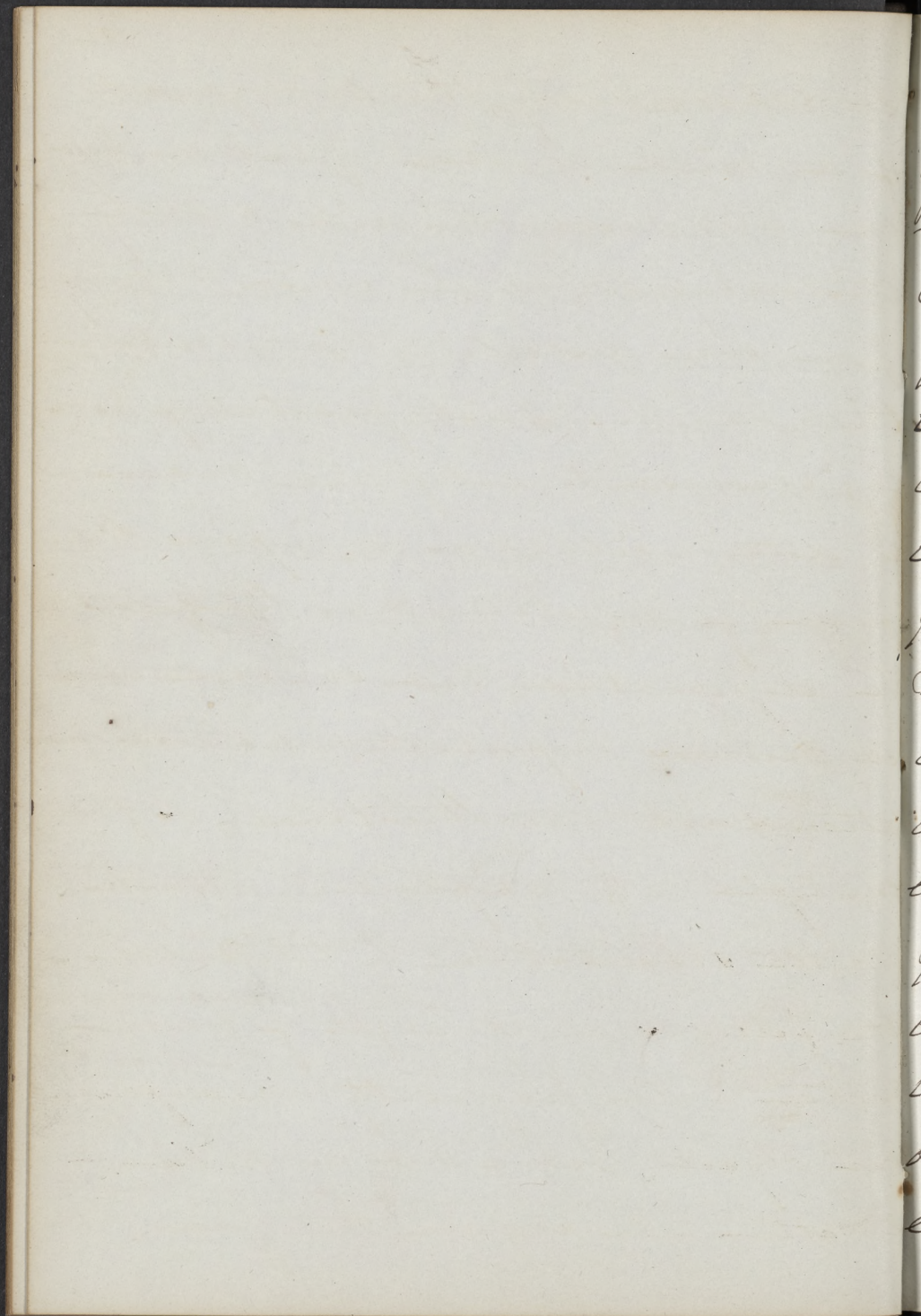
deadened & that by administering-
 too much of the emetic substance,
 inflammatory lesion of the stomach
 may be brought on; the proper plan
 is to give a decided dose, and
 endeavour to arouse the sym-
 ptomatic susceptibility by diminish-
 ing the turgescence of the brain, &
 this can be accomplished by cold
 dashing, revulsives & a moderate
 abstraction of blood. Free ablu-
 tion of the stomach should be avoi-
 ded as by it the absorptive may
 be rendered more vigorous, the
 drinks that are usually employed
 must be withheld until vomiting
 has taken place.

When acid substances have been



swallowed, although the irritation of the stomach may induce sickness and vomiting, yet it may be but partial and consequently ineffectual, a mild emetic readily inducing free vomiting, will relieve the organ.

But there are other cases in which it is expedient to unload the stomach, as where crude and indigestible substances or articles of food have been taken, which irritate the mucous surface, oppress, and interfere with the digestive function & give rise to general symptoms of malaise restlessness & fever. Children frequently suffer from such a cause & may readily



be relieved by the employment of a mild emetic. Flatulencies however are most obnoxious to such disturbance, which arises more from over distention than irritation. The habitual practice of having recourse to artificial means is detrimental as it impairs the power of digestion & is therefore to be deprecated, but in some cases it becomes important, where serious attendants are threatened, as for example an apoplectic attack. Gentle solicitation by titillating the fauces, or draughts of warm water will frequently accomplish our object, but if not, a mild emetic will perform the office.

+ of this a most interesting instance
occurred in a gentleman of this -
city many years ago in Paris.

Total incapability from overdistension may occur & the individual's life become a sacrifice to his appetite. Of this numerous examples are on record; in this case also rupture of the stomach has been met with.

A state simulative of apoplexy occasionally occurs from distension of the organ by crude ingesta & where without assistance it could not relieve itself. Even a condition of torpor & obliteration of the functions of life that has been mistaken for death itself, has arisen from a similar cause.⁺

Various cutaneous affections produced by the ingestion of substances

that have irritated the stomach, -
 are met with in practice, either -
 originating in the peculiar acrimo-
 nious or poisonous character of the
 substance, or else in idiosyncrasy. -
 Of such Urticaria is an example.

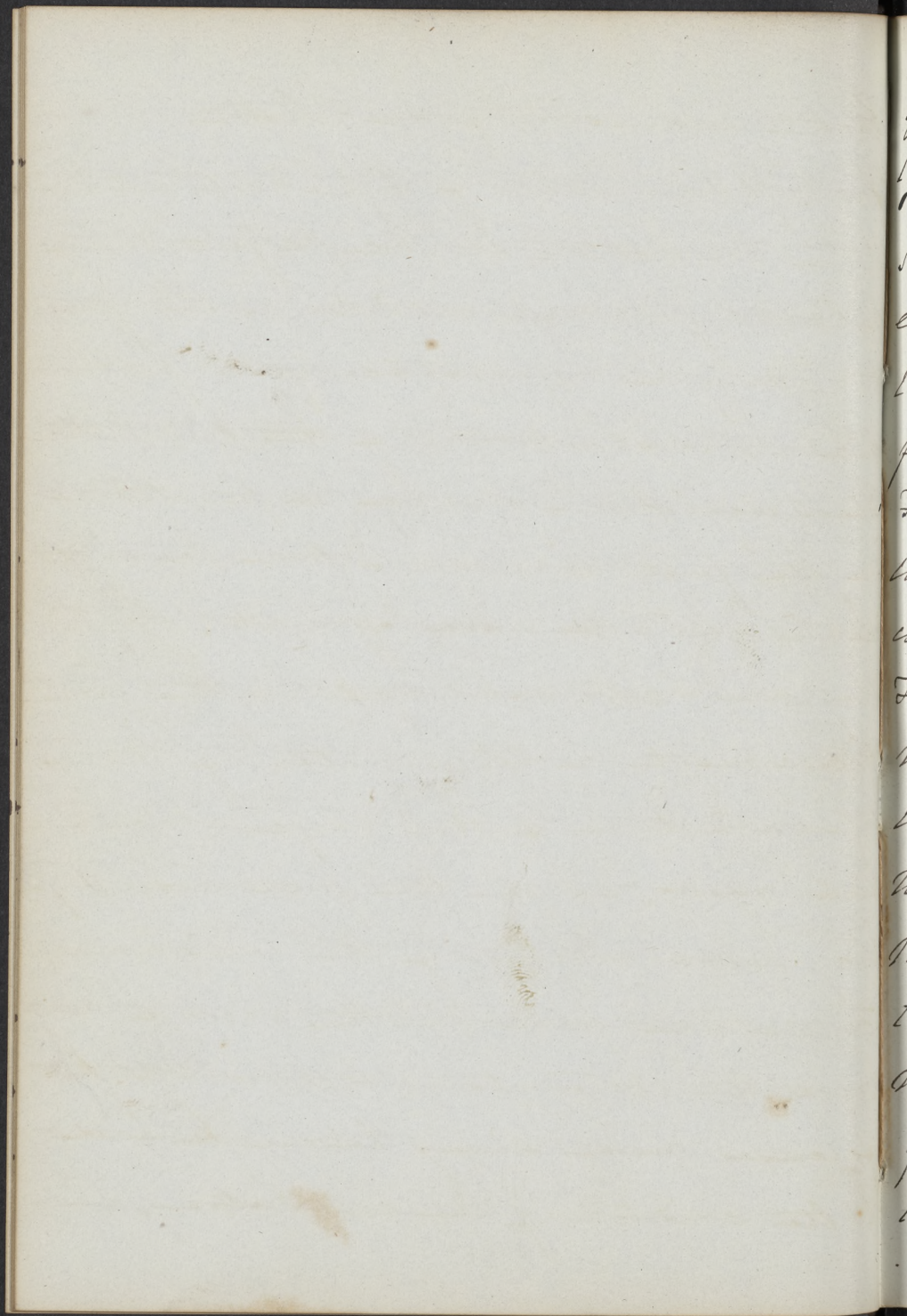
II. To unload contiguous viscera,
and excite the portal circulation.

The viscera that are impressed
 by the action of an emetic, are
 the liver, the pancreas and spleen,
 and certain engorged conditions -
 of them may exist which may be
 relieved in this way. The benefit
 to be derived is from evacuating -
 the ducts of the liver and the
 gall bladder, as well as the duct
 of the pancreas, & from quickening
 the activity of the circulation in -

Handwritten text from the adjacent page, visible on the right edge. The text is partially cut off and includes words such as "A", "co", "ac", "S", "2", "F", "L", "N", "L", "D", "C", "C", "F".

The organs mentioned & the venous distribution to the abdominal viscera constituting the portal circle. Such is the explanation of the excretive operation in chronic hepatitis & hepatitis & congestion of the pancreas. In these affections conjoined with torpidity of the circulation, there is retention of the ^{secretions} ~~secretions~~, which by becoming acid may prolong irritation; or as in jaundice the bile may not be eliminated from the secreting vessels & becoming absorbed may manifest itself in the fluids.

Either associated with or independent of jaundice gall stones may be come impacted in the hepatic duct from which they can be dislodged



by the concussion of an emetic.

In inflammation of high local action -
Some hesitation should be felt in
exhibiting these articles, as the affec-
tion may be aggravated by too power-
ful a disturbance of the circulation.
Free depletion should be practised -
in the first instance & then an emetic
is becomes safe and efficient.

They are best exhibited at the com-
mencement or termination of the
inflammation of the large abdomi-
nal organs, as in the first case they
may cause abortion of the inflamma-
tory action and in the second re-
move the obstruction that is left. Re-
ference must always however be had
to the condition of the circulation.

and

III. To reduce arterial circulation,

With this indication they are given -
partly in Fevers, and inflammatory af-
fections. Haemecia in itself is depressing -
to the circulation, but as a large amount
of secretory fluid is removed, by the dis-
charge from the emunctories, the vessels
are deprived of a considerable quantity
of fluid, which takes off tension from
them. They further are depressing to the
circulation by removing aliment from
the stomach, which if digested and
carried into the bowels would tend to
augment the volume of blood & aggre-
vate inflammation.

